

Cellulitis in Children

Abstract

Children who require intravenous antibiotics for cellulitis are typically admitted to the hospital, whereas adults typically receive intravenous antibiotics at home. This is a Randomised Controlled Study (RCS) comparing the delivery of ceftriaxone at home against usual care of flucloxacillin in the hospital for the treatment of cellulitis in children. The goal of the study is to compare:

- The rate of treatment failure at home versus in the hospital
- The safety of treatment at home versus in the hospital
- The effect of short-course ceftriaxone versus flucloxacillin exposure on nasal and gut microorganism resistance patterns, as well as the clinical implications.

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Introduction

Children with cellulitis who require intravenous antibiotics are typically admitted to the hospital, whereas adults frequently receive intravenous antibiotics at home. Parental concern and the acute nature of the infection in youngsters have been cited as some of the explanations. Children treated at home, on the other hand, fare better psychologically and physically, have fewer investigations, are at lower risk of hospital-acquired illnesses, and require fewer healthcare resources as a result of their treatment [1,2]. It's also less expensive (in terms of time off work and transportation expenses) and less disruptive for families [1,3]. Some children with moderate to severe cellulitis can be treated successfully at home, but the criteria are unclear [4]. In children with cellulitis, there are no randomised trials comparing home versus hospital care. Due to severe, fast spreading, or difficult cellulitis or worsening characteristics despite oral medicines, 57% of children presenting with cellulitis to the Emergency Department (ED) were discharged on oral antibiotics, and 43% were treated with IV antibiotics. Oral treatment had been initiated in 45% of patients with uncomplicated moderate/severe cellulitis, although cellulitis had advanced despite this [5]. 10% of patients who were discharged on oral antibiotics returned with worsening cellulitis, implying that there is a culture of trying oral drugs first and not starting intravenous antibiotics unnecessarily. Flucloxacillin or cephazolin are commonly used as intravenous treatments for cellulitis because they are effective against *Staphylococcus aureus* and group A, streptococci, the primary bacteria that cause cellulitis [6]. Due to their frequent dosing, they are not suited for Outpatient Parenteral Antibiotic Therapy (OPAT). The

majority of paediatric OPAT services are only able to deliver once daily interventions. Ceftriaxone is an antistaphylococcal antibiotic that can be taken once a day [5]. Only a few trials in children have used ceftriaxone to treat cellulitis in the hospital or during OPAT, but none have compared outcomes to children treated with other antibiotics [4]. There have been no studies comparing home and hospital administration in children with cellulitis who require intravenous treatment. There was an 80% success rate in a trial of children with moderate/severe cellulitis who were treated with ceftriaxone in a day treatment centre, but no comparison was made with children treated in hospitals [4]. Other studies that used ceftriaxone to treat cellulitis in children reported cure rates of 91%-96%, but they had limited sample sizes, no comparison group, and/or unclear methodology [6]. Ceftriaxone and flucloxacillin were tested in a short research in adults, and while ceftriaxone had a greater success rate than flucloxacillin (96% versus 70%), the difference was not statistically significant. Ceftriaxone and flucloxacillin have diverse effects on the microbiome of children, which has never been studied before. Hospitals are increasingly creating Hospital-In-The-Home (HITH) programmes, in which patients who would normally be treated on a hospital ward are treated at home under the supervision of hospital doctors and nurses. While HITH treatment appears to be cost-effective and safe, it is uncertain to what extent it is effective and safe. The goal of the study is to compare:

- The rate of treatment failure of home treatment with intravenous ceftriaxone versus hospital treatment with intravenous flucloxacillin
- The safety of home treatment versus hospital treatment

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- The effect of short-course ceftriaxone versus flucloxacillin exposure on nasal and gut microorganism resistance patterns, as well as the clinical implications of these differences

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