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EDITORIAL

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Searching for a simpler treatment for paediatric osteoarticular infections

For many decades, the traditional way of treating paediatric acute bone and joint infections has been a large dose of antibiotics, delivered intravenously for at least a week, followed by several week's oral antibiotics. The erythrocyte sedimentation rate was the yardstick and once it had been normalised to around 20 mm per hour, the antibiotic could finally be discontinued (1,2). In reality, the treatment took one to three months, sometimes longer. Interestingly, clinicians seem to have forgotten that the first successful treatments with sulphonamides in late 1930s only lasted a few days and the administration was mostly oral (3). However, the symptoms could flare up again, and this was one of the reasons that longer periods of treatment became commonplace.

Much has changed since those days. Many colleagues still believe that it is necessary to have lengthy antibiotic courses for ostearticular infections and this view is even more widely held in adult medicine. So far, the best counter argument in paediatrics has come from a prospective trial in Finland, which reported 130 cases of osteomyelitis and 131 cases of septic arthritis that were treated, at random, with a short or long course of large dose clindamycin or a first-generation cephalosporin (4,5). The duration of the short course was 20 days for osteomyelitis and 10 days for septic arthritis and the long course lasted 30 days for both conditions. Following the first 2–4 days of intravenous treatment, the administration was switched to oral. The end result of this study, which is the largest of its kind to date, was that most of the cases could be treated with these antibiotics and the best duration was three weeks for osteomyelitis, and 10-14 days for septic arthritis. Serial measurements of serum C-reactive protein proved a reliable yardstick in diagnosing and monitoring the course of illness, unlike the erythrocyte sedimentation rate, whose kinetics and normalisation speed were too slow to be useful at the follow-up stage (6).

Although the treatment in the Finnish trial was initiated intravenously, we were not sure if that was necessary and voiced that view more than once (1, 2, 4–7). However, the small number of patients in our country did not allow us to test this hypothesis in practice. On the other hand, children with these two conditions are usually sedated or anaesthetised to obtain the pivotal microbiological samples by bone aspiration, arthrocentesis and blood cultures. In that setting, it would be easy to give the very first dose parenterally.

In this issue of *Acta Paediatrica*, Alcobendas et al. from Madrid present their results of 25 children with an osteoarticular infection who were treated as outpatients (8) and only received oral antibiotics. They gave them maximum doses of cephalosporin, amoxicillin-clavulanate or clindamycin for a median duration of 21 days, but did not state how high the doses actually were. The patients were compared to 228 hospitalised children, also with an osteoarticular infection, whose data were collected from around the country. This group was initially treated intravenously for eight days and then orally, for a total duration for 29 days. Very few further details were given, but we assume that the treatment was otherwise similar to that executed in Madrid. The information did not actually allow a direct comparison between the two series, but the groups were rather similar in disease manifestation, age, gender, fever, C-reactive protein and erythrocyte sedimentation. The take-home message of the Spanish survey was that all 25 of the children who only received oral antibiotics recovered uneventfully, while 24% of the 228 patients who were started on intravenous antibiotics experienced complications and 7% were left with sequelae.

The authors are to be commended for their approach and the results are encouraging. However, before generalising the results, several caveats must be listed.

First, the sample size was under-powered for any meaningful statistical analysis, particularly because the study was not randomised, let alone blinded.

Second, less than half of the cases in both groups – 36% in the oral treatment group and 45% in the intravenous and oral group – were identified aetiologically and this raises several unaddressed questions.

Third, every fourth (24%) child in the group that just received oral antibiotics had the *Kingella kingae* infection, which is notoriously mild, easily treatable and has favourable outcomes (9). In the intravenous and oral group, this agent was found in 9% of cases. The mild nature of the cases was reflected in the C-reactive protein elevation, which had a median that was initially no higher than 23 mg/l in the oral only group and 47 mg/l in the intravenous and oral group, with very few children demonstrating levels over 100 mg/l.

Fourth, the number one global agent in osteoarticular infections, *Staphylococcus aureus,* which has the potential to cause a turbulent disease, was only identified in two (8%)

cases in the oral group and 56 (25%) cases in the intravenous and oral group. No cases of methicillin-resistant *Staphylococcus aureus* were found in the oral only group and the rate in the intravenous and oral group was 3%.

Fifth, no detailed information was given on the issues that are currently thought to be the cornerstones of successful short antibiotic treatment, namely administering an antibiotic that is absorbed well and time dependent, such as clindamycin or beta-lactams, four times a day. The same large-enough doses, namely ≥40 mg/kg/day of clindamycin or ≥150 mg/kg/day of first-generation cephalosporin, given intravenously should also be given as an oral administration. The course of the illness should then be carefully monitored, initially with daily C-reactive protein measurements. Once this marker has decreased to a value of around 20 mg/l, antibiotics can probably be discontinued, no matter how high the erythrocyte sedimentation is (1,2,4,5).

In conclusion, we found that the report by Alconbendas et al. (8) was interesting and thought-provoking. There is no doubt that many bone and joint infections can be treated solely with oral antibiotics, but only sufficiently powered prospective and randomised studies will teach us to what extent the findings of this preliminary investigation can be generalised. Having said that, short-term intravenous antibiotics are still useful in situations in which oral administration is contraindicated, such as with a nauseous or septic patient. The clinician must also be thoroughly aware of the properties of the antibiotic he or she plans to use, as not all parenteral agents work as well when their administration is switched from intravenous to oral forms.

CONFLICT OF INTERESTS

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