

Questions and Answers

Question: Intramuscular injections can be painful and require a certain amount of skill to administer. Do you use them a great deal in your practice?

Dr J. E. Leggett: We seldom, if ever, use intramuscular injections. Even with short term use, we typically either administer the drug intravenously or employ an oral agent with good bioavailability. Practitioners who do employ intramuscular injections usually need to have well trained nurses, and often have to administer injections with a local anaesthetic.

Question: Do you find that vancomycin is well tolerated in an outpatient setting?

Dr Leggett: We have found that vancomycin is generally well tolerated in the outpatient setting. At times, we have to slow the rate of administration in order to circumvent the 'red man syndrome'. We have seldom needed to employ antihistamines. Unfortunately, a significant time commitment is required in order to administer vancomycin twice daily, with at least a 60-minute duration of infusion. Since we have seen cytopenias on rare occasions, laboratory monitoring is suggested.

Question: Please elaborate on why third generation cephalosporins should be administered in preference to older derivatives when the pathogens have not yet been identified.

Dr E. Strehl: Compared with third generation cephalosporins, the older derivatives lack activity against a number of Gram-negative organisms, especially several β -lactamase-producing strains. In addition, their pharmacokinetic profiles do not allow once-daily administration. Third generation cephalosporins, with their broader spectrum of activity, exhibit better tolerability and provide derivatives that are appropriate for once-daily administration, e.g. ceftriaxone, which may be an important factor in outpatient therapy.

Question: It is stated that, in situations where

impaired kidney function is suspected, but not yet diagnosed, cefoperazone and ceftriaxone represent a lower risk to the patient. Please elaborate. Are there any specific advantages for outpatient parenteral antibiotic therapy (OPAT) in this instance?

Dr Strehl: Cefoperazone and ceftriaxone are cephalosporins excreted not only via the kidneys but also to an appreciable extent via the bile. Therefore, their clearance is not altered to a clinically significant degree in patients with renal insufficiency, and it is not necessary to adjust the dosage regimen in such situations. This is a distinct advantage in outpatient therapy, where strict surveillance of renal function is more difficult than in hospitals.

Question: The advantages of an OPAT approach are clear. However, patient education and follow-up appear to be crucial to the successful implementation of such a programme. Please describe the respective roles of the physician, nurse and pharmacist in this important area.

Dr S. Esposito: Several delivery models have been developed in the USA and, more recently, in other countries. These models differ mainly with regard to where the drugs are administered (home or infusion centre) and who administers them (nurse or self-administration). However, the OPAT team is basically the same for any model. It is made up of three different professionals: the physician, the nurse and the pharmacist, each of whom has his/her own responsibilities.

The physician is, of course, responsible for establishing the diagnosis and authorising the treatment or, in other words, for choosing the patient's treatment – a very important issue for OPAT. Therapy for individual patients must be carefully selected on the basis of differing social and clinical criteria, which must be clearly identified for any diagnosis.

The nurse is mainly responsible for establishing

venous access, developing the treatment plan, instructing patients about possible adverse effects or training them for self-administration.

The role of the pharmacist depends on the different healthcare systems provided in different countries, but this professional is fundamentally responsible for preparing and providing the antibiotic and supplies.

Apart from the main responsibilities of each professional reported above, a safe and efficient therapeutic programme is best provided by teamwork, especially in evaluating the infection status and monitoring possible toxicity during the course of therapy.

Question: What are some of the strategies currently adopted to reduce potential disadvantages associated with OPAT?

Dr Esposito: The main disadvantages associated with OPAT are possible delays in the recognition and treatment of adverse effects.

Three main strategies should be, in my opinion, constantly adopted:

1. Antibiotics with very low rates of toxicity and adverse effects, such as third generation cephalosporins, should, whenever possible, be preferred. The potential toxicity of antibiotics such as vancomycin or aminoglycosides should always be considered, and the use of such drugs limited.

2. The patient should receive careful training about different aspects of OPAT.

Patient education regarding therapy, therapeutic monitoring procedures, possible adverse effects occurring at early or late stages during the course of treatment, and emergency interventions are essential in reducing the risk of delays in the treatment of possible complications.

3. The 24-hour availability of each professional of the OPAT team should be ensured.

Question: Of the 3 delivery models for OPAT that you refer to, which is currently considered the most successful from an economic perspective?

Dr A.D. Tice: The visiting nurse model is cost effective when the cost of sending a nurse to the home is low; this is a possible option in some developing countries. The office infusion centre is particularly good when there is a low volume of patients and limited resources. The self-infusion

model is probably the least expensive in terms of staff and facilities, but requires significant expertise and patient training.

Question: You state that to capitate OPAT care on a per member/per month basis is a significant risk. Please elaborate; will the advantages of such an approach outweigh the associated risk?

Dr Tice: In order to capitate care, you must know your costs and volume, and be able to control the speed of your payments. If these conditions cannot be met, you could well lose money with a fixed rate of compensation. However, if these figures are known and can be controlled, you could well make money. There is also the potential to save money for insurance companies, as well as limit their risk. A sudden 'flood' of outpatient intravenous therapy patients resulting from early discharge could save the insurer money but be a disaster for the provider. It is usually best to start with a limited degree of risk sharing or bundling of services while a system for cost analysis and containment is developed.

Question: In the ambulatory setting, have the clinical efficacy and tolerability of parenteral cephalosporins that have been demonstrated in various patient populations and serious infections also been observed in the elderly?

Dr D. Nathwani: There is good evidence that parenteral cephalosporins are efficacious and well tolerated for a variety of serious infections in elderly patients. For example, the study by Angel and colleagues^[1] was carried out in patients aged more than 60 years. These patients predominantly had pneumonia and skin/soft tissue sepsis, while a small number had a variety of other infections. Furthermore, other studies^[2] have confirmed significant economic savings resulting from a faster return to nursing homes for patients hospitalised for infection and subsequently treated with once-daily parenteral cephalosporins.

Question: Treatment of lower respiratory tract infections predominantly with oral therapy has been associated with higher rates of initial treatment failure and hospitalisation compared with treatment in which the initial therapy is often parenteral. While the reasons for this are currently

unclear, please postulate on the most likely explanations.

Dr Nathwani: The apparent lower initial failure rates for patients with lower respiratory tract infections treated with parenteral therapy may reflect a number of factors: compliance with parenteral treatment may have been superior; there may have been inappropriate use of the oral route or choice of an unsuitable oral antibiotic; patients treated orally are possibly 'sicker'; and oral therapy was either less efficacious or not as well tolerated.

Whether parenteral therapy dealt better with resistant strains compared with oral therapy cannot be determined. Further well designed case-controlled studies may be able to address this apparent discrepancy.

References

1. Angel JVG and the HIAT Group. Outpatient antibiotic therapy for elderly patients. *Am J Med* 1994; 97 Suppl. 2A: 43-9
2. Glick HA, Eisenberg JM, Koffer H, et al. Savings from faster return to nursing homes for patients hospitalized for infection. *J Res Pharm Econ* 1991; 3 (4): 41-70