**CASE REPORT**

**Treatment of neurosyphilis with ceftriaxone**

S Shann, J Wilson

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**DISCUSSION**

The recommended treatment for neurosyphilis is penicillin. Doxycycline and amoxicillin have been evaluated as second line options but as they are given orally, there may be adherence issues. The UK national guidelines and the European guidelines for the management of syphilis do not recommend ceftriaxone for the treatment of late syphilis. However, the CDC Sexually Transmitted Diseases Treatment Guidelines 2002 suggest that it may be used as an alternative in penicillin allergic patients with neurosyphilis.

Ceftriaxone has been proved to have good CNS penetration. A dose of 1 g daily achieves levels well above the MIC for Treponema pallidum of 0.0006 μg/mL. It also differs from other cephalosporins by having an unusually long serum half life of approximately 7 hours. However, there have been reports that intramuscular ceftriaxone may not be adequate treatment for neurosyphilis. A retrospective study of HIV infected individuals treated with ceftriaxone for asymptomatic neurosyphilis or latent syphilis revealed a 23% failure rate. Another study suggested that intravenous ceftriaxone may be an alternative to penicillin for treatment of HIV infected patients with neurosyphilis complicating early syphilis infection. However, in this setting, disease may be confined to the meninges and/or acute coronary ostitis. He received 1 g of ceftriaxone once daily for 14 days.

He was reviewed 7, 19, and 36 months after treatment with repeat syphilis serology of blood and CSF (see table 1). Clinically he made some improvement in terms of his memory, speech, and mobility.

**Table 1**  
**Blood and CSF parameters before and after treatment with ceftriaxone**

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Blood and CSF parameters before and after treatment with ceftriaxone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sept 97</td>
</tr>
<tr>
<td><strong>Blood</strong></td>
<td></td>
</tr>
<tr>
<td>TPHA*</td>
<td>Pos</td>
</tr>
<tr>
<td>FTA abs</td>
<td>1 in 128</td>
</tr>
<tr>
<td>RPR</td>
<td>Pos</td>
</tr>
<tr>
<td>Albumin (g/l)</td>
<td>41</td>
</tr>
<tr>
<td>IgG (g/l)</td>
<td>14.1</td>
</tr>
<tr>
<td>Glucose (mmol/l)</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>CSF</strong></td>
<td></td>
</tr>
<tr>
<td>TPHA*</td>
<td>Pos</td>
</tr>
<tr>
<td>FTA abs</td>
<td>1 in 64</td>
</tr>
<tr>
<td>RPR</td>
<td>Pos</td>
</tr>
<tr>
<td>Protein (g/l)</td>
<td>2.03</td>
</tr>
<tr>
<td>Albumin (g/l)</td>
<td>-</td>
</tr>
<tr>
<td>IgG (g/l)</td>
<td>-</td>
</tr>
<tr>
<td>White cells (x10⁶)</td>
<td>32</td>
</tr>
<tr>
<td>Glucose (mmol/l)</td>
<td>2.5</td>
</tr>
<tr>
<td>IgG index (&lt;0.70)</td>
<td>-</td>
</tr>
<tr>
<td>Albumin quotient</td>
<td>-</td>
</tr>
</tbody>
</table>

*In January 2000 the laboratory began monitoring TPPA instead of TPHA.*
may be easier to cure than disease of longer duration that could involve meninges and brain parenchyma.8

The patient in our case had evidence of both cerebrovascular and parenchymal disease. He received 14 days of ceftriaxone (3 days intravenously and 11 days intramuscularly) and was followed up for 36 months with blood and CSF analysis. His blood RPR fell from 1 in 128 pre-treatment to 1 in 16 (a threelfold reduction) 36 months after treatment. His CSF TPHA and FTA abs have remained detectable but the RPR was negative on the last occasion. The protein level in the CSF has consistently declined from 2.03 g/l to 0.55 g/l as have the CSF albumin and IgG levels. The IgG index remains elevated but the albumin quotient has normalised. Even after successful treatment these latter two parameters may remain abnormal.3

There are few other reports of successful treatment of symptomatic neurosyphilis in HIV negative individuals with ceftriaxone. There is a single case of treatment of asymptomatic neurosyphilis9 and of treatment of meningomyelitis complicating secondary syphilis.10 Our case suggests that ceftriaxone may be a useful alternative in HIV negative patients with neurosyphilis, but because of the doubt about its efficacy in those who are co-infected, a larger study with CSF levels of ceftriaxone should be performed.

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