strains compared with only 14% of patients infected with non-ESBL-producing strains. Most of the patients received a dose of 200 mg three times daily in accordance with national guidelines. This was in contrast to the study by Jansøker et al., in which 77% of patients received twice this dose (400 mg three times daily), and this is likely to be a factor in the difference in outcomes between these studies.

Our study suggests that mecillinam is a relatively poor substrate for hydrolysis by NDM-1 carbapenemase and most of the isolates (83.9%) possessing this enzyme were susceptible under standard test conditions. The proportion of resistant isolates was much higher for K. pneumoniae (50%) than for E. coli (3.5%). Although there was a substantial increase in mecillinam resistance when the inoculum was increased 100-fold, this is likely to be the case for other antibiotics to which these bacteria are, on occasion, deemed to be susceptible—not least carbapenems. Enterobacteriaceae with NDM-1 are common in both hospitals and the community in areas of the Indian subcontinent and are isolated with increasing frequency in countries across the world. Such isolates frequently have resistance to a wide range of antimicrobials and treatment options may become increasingly limited. In such circumstances, the use of mecillinam alone, or in combination with other agents, may warrant further investigation into its potential in the treatment of uncomplicated UTI.

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Transparency declarations
None to declare.

References

Two weeks following the urological procedure, a repeat urinalysis showed pyuria with >50 white blood cells and urine culture showed growth of 15 000 cfu/mL of *K. pneumoniae*. On this occasion, the organism remained susceptible to tigecycline, but with an increased MIC of 2 mg/L. No treatment was initiated since she was asymptomatic and clinically stable. She had no further admissions for urinary tract infection or sepsis.

It is well known that certain microorganisms (e.g. Proteus) can cause stone formation through their ability to degrade urea using the enzyme urease and *K. pneumoniae* is one of those important urease producers. Complete removal of infected stones is paramount as residual stones can complicate the treatment of urinary tract infections by causing relapse of infection and persistent infection can likewise lead to ongoing stone formation. The successful outcome in this patient is attributed to adequate source control through extraction of her staghorn calculus as well as doubling the usual dose of tigecycline. Other studies have advocated the same (see the accompanying systematic review7). In conclusion, high-dose tigecycline may be a reasonable treatment option for multidrug-resistant urinary tract infections when effective source control can be accomplished.

### Acknowledgements
We acknowledge David P. Nicolau, Pharm D at Hartford Hospital, Center for Anti-Infective Research, for providing tigecycline serum concentrations (Table 1).

### Funding
This study was carried out as part of our routine work.

### Transparency declarations
None to declare.

### References

### Table 1. Pharmacokinetic parameters after the end of tigecycline infusion

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Cₘₐₓᵃᵇᶜ (mg/L)</th>
<th>AUC (mg·h/L)</th>
<th>fAUC (mg·h/L)</th>
<th>fAUC/MICᵈ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.9</td>
<td>2.38</td>
<td>0.50</td>
<td>0.50</td>
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<tr>
<td>6</td>
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<td>5.52</td>
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<td>1.16</td>
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</tr>
<tr>
<td>24</td>
<td>0.4</td>
<td>13.53</td>
<td>2.84</td>
<td>2.84</td>
</tr>
</tbody>
</table>

ᵃTigecycline serum concentration (Cₘₐₓ) after 2 h infusion of a 200 mg intravenous dose.
ᵇTesting was by a validated HPLC method through the Center for Anti-Infective Research and Development (David P. Nicolau, Pharm D at Hartford Hospital, Center for Anti-Infective Research).
ᶜThe patient received tigecycline for 48 h at 200 mg intravenously daily prior to these samples.
ᵈTigecycline MIC by Etest = 1.0 mg/L.