In this study, we investigated the molecular mechanism behind bayberry treatment of cholera described in ancient Chinese medicine. We found that an extract derived from a simple and rapid extraction of bayberry fruits could repress *V. cholerae* virulence gene expression at low concentrations and inhibit *V. cholerae* growth at high concentrations. Intriguingly, this bayberry extract did not inhibit or kill many non-pathogenic bacteria tested, including *Escherichia coli* and *Bacillus subtilis* (data not shown). The narrow-spectrum bactericidal activity of the bayberry extract may thus preserve normal intestinal flora during treatment. Thus far, there has been little success in finding cheap and effective treatments for poverty-associated infectious diseases like cholera. For example, although Hung et al.* reported a compound that can specifically inhibit *V. cholerae* virulence and intestinal colonization. Science 2005;310:670–4.

Further study is necessary to reveal the exact nature of bayberry extract inhibition of *V. cholerae* infection, but consumption of bayberry fruits or fruit extracts may prove to be a cheap alternative therapy for cholera in many developing countries.

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**Transparency declarations**

None to declare.

**Supplementary data**

A colour version of Figure 1 is available as Supplementary data at JAC Online (http://jac.oxfordjournals.org/).

**References**

that differentiates between S. aureus and CoNS, as S. aureus produces a nuclease that is uniquely and consistently thermostable. TSN testing involves removing 2–3 mL of blood broth from a blood culture and heating the blood broth in a boiling water bath for 15 min. Once cooled, two to three drops are placed in a 6 mm well cut in the media (Southern Group Laboratory, Corby, UK) and the plate is incubated for 2–4 h at 37°C. A positive reaction, indicating thermonuclease activity, shows an area of clearing at the edge of the well. Addenbrooke's Hospital is a tertiary referral hospital with 1100 beds. The impact of the TSN test on the immediate management of positive blood cultures was assessed for the calendar month of August 2007. Blood cultures were processed using BacT/Alert 3D (bioMérieux, Basingstoke, UK), and TSN testing was performed when Gram-positive cocci in clumps were seen on microscopy. Blood cultures growing the same organism within a 2 week period were counted as one episode. Patients were identified prospectively and assessed to determine the reliability of the test (in terms of sensitivity, specificity and positive- and negative-predictive values), when compared with tube coagulase, and the impact of the TSN result following a positive- and negative-predictive values, when compared with the reliability of the test (in terms of sensitivity, specificity and positive- and negative-predictive values), when compared with tube coagulase, and the impact of the TSN result following a clinical evaluation of the patient (i.e. no impact, start antimicrobial therapy, withhold therapy or stop therapy).

Ninety patient episodes (123 staphylococcal bacteraemias) occurred in the study period. CoNS accounted for 75 episodes, S. aureus for 11 and Micrococcus spp, for 4. TSN was performed in 88 of 90 episodes (Gram-positive cocci in chains and Gram-negative bacilli were seen on the original Gram film in one case each; the subsequent cultures from these blood cultures were mixed). The sensitivity, specificity and positive- and negative-predictive values were 81.8% (9/11), 97.4% (77/79), 100% (9/9) and 97.4% (77/79), respectively (Table 1). Antimicrobial treatment was withheld in 8 of 88 (9.1%) cases pending the TSN result and was not commenced when a negative result was obtained. Antimicrobial therapy was commenced as a result of a positive TSN result in 2 of 88 (2.3%) cases. A negative TSN did not result in treatment cessation when patients were already on antimicrobial agents at the time of the positive blood culture. The TSN made no immediate clinical impact in 78 of 88 (88.6%) cases. One of the two false-negative TSN results was a transcription error and the other was a patient with neutropenic sepsis. Both of these patients were receiving empirical antimicrobial treatment, so the TSN result had no effect on therapy.

The performance of TSN has been described previously. However, to the best of our knowledge, no previous study has attempted to address its clinical impact. An obvious benefit would be that it allows earlier targeted treatment of sepsis. Both of these patients were receiving empirical antimicrobial treatment, so the TSN result had no effect on therapy.

Table 1. Performance table comparing TSN and coagulase results

<table>
<thead>
<tr>
<th></th>
<th>Coagulate positive</th>
<th>Coagulate negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSN positive</td>
<td>9</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>TSN negative</td>
<td>2</td>
<td>77</td>
<td>79</td>
</tr>
<tr>
<td>No TSN result</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>79</td>
<td>90</td>
</tr>
</tbody>
</table>

TSN is simple and cheap and does not require complex and expensive equipment or expertise, enabling it to be used in any clinical laboratory. Although this study is small, with only 90 episodes, it is prospective in nature. We believe that TSN is a useful adjunct to routine staphylococcal identification methods and leads to a reduction in unnecessary antimicrobial use.

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References


In vitro activities of combinations of amphotericin B, posaconazole and four other agents against Rhizopus

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