Comparison of a clinical score with individual clinician judgement for assigning priority for heart valve surgery

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Abstract

Methods

Results

Limitations

Background: Priority for cardiac surgery is usually based on a clinician’s judgement of the urgency of the case (1). Although a few systems have been developed to improve the accuracy and consistency of this assessment a working group of New Zealand Cardiologists and Cardiac Surgeons developed a Clinical Priority Score (CPS) for assigning priority for surgery heart valve disease based on current guidelines of the AHA/ACC and ESC. The categories included the severity of the valve lesion, symptoms related to the valve lesion, the presence and amount of cardiac dysfunction, risk of progression and the presence of an additional AHA/ACC/ESC class I or 2a indication for surgery. Other definitions related to individual valve lesions the combined effect of the valve lesion is used for all valve lesions. In the case of multiple valve lesions the combined effect of the valve lesions is used to estimate severity. To stratify urgency a more graded scale of symptoms, severity of disease and cardiac dysfunction than defined in the AHA/ACC1 and ESC guidelines2 were used.

Methods

Novel software (1000Minds) was used to assess point values. According to a consensus of 1000Minds to answer a series of questions designed to reveal priorities concerning the relative importance of different criteria. Each question presents a pair of hypothetical patients, defined on two criteria at a time and involving a trade-off between them.

Which patient should have surgery first assuming all other variables are equal?

This patient

They are

This patient

Valve

Severity

Is moderate

Severe

Symptoms

Are moderately limiting

None

Six cardiologists and two cardiac surgeons used an electronic response tool to independently vote on who should be treated first. If the vote was not unanimous a majority decision was made after discussion. Consistency was checked by answering some questions a second time. The 1000Minds software calculated point values based on responses to multiple questions using a type of conjoint regression analysis known by the acronym PAPRIKA (Potentially All Pairwise Rankings of all possible Alternatives).

Clinical priority score to grade urgency of heart valve surgery

<table>
<thead>
<tr>
<th>Category</th>
<th>Grade</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severity</td>
<td>Mild</td>
<td>No symptoms, no symptoms related to valve lesion</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Symptoms, no symptoms related to valve lesion</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>Symptoms, symptoms related to valve lesion</td>
<td>12</td>
</tr>
<tr>
<td>Source</td>
<td>None</td>
<td>No known source of cardiac dysfunction</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Mild cardiac dysfunction</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Moderate to severe cardiac dysfunction</td>
<td>12</td>
</tr>
<tr>
<td>Valve lesion</td>
<td>None</td>
<td>No valve lesion</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Mild</td>
<td>No severe valve lesion</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Severe valve lesion</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>Another AHA/ACC or ESC class 1 or 2a indication for surgery, for example severe coronary artery disease or ascending aortic disease</td>
<td>20</td>
</tr>
</tbody>
</table>

Evaluation of point score

Testing on case vignettes

Twenty-five case vignettes representative of the broad range of patients referred for urgent or elective heart valve surgery were evaluated. Clinicians using clinical judgement independently ranked cases on the urgency for surgery from 1 to 25. The vignettes were then discussed by the group and a consensus ranking agreed. The median of the case vignettes was also scored using the CPS by two cardiologists who were blind to the consensus clinical ranking. The consensus rank served as the gold standard.

Discussion

The 1000MINDS software reduces a complex decision influenced by many variables to a series of simple trade-offs which could only be a two at a time. A decision in which multiple variables must be considered simultaneously.

The priority score provided a priority ranking which was consistent with that made by a consensus of clinicians who evaluated case vignettes using judgement alone in the usual way. Responses to different dilemmas may differ by local practice and interpretation of evidence.

Conclusion

A novel method for creating a simple point score for assigning priority for heart valve surgery is described. Use of point scores may enable fairer allocation of limited resources, provide greater transparency to clinical decision making and improve understanding of reasons for differences in practice between clinicians and institutions.

References