The Surprise Question in Older Hospitalized Patients

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Research Letters

The Surprise Question in Older Hospitalized Patients: To Use or Not to Use?

To the Editor:

Identifying patients in the palliative phase is challenging but important, as timely and proactive palliative care can improve quality of life. One way of determining whether a patient is in the palliative phase is via the Surprise Question, a widely recommended single-item tool (Would I be surprised if this patient died in the next 12 months?). However, there is a distinct lack of studies into the performance of the Surprise Question in older hospitalized patients. Currently, relatively few frail older patients have the opportunity to discuss their end-of-life care with their physician, even though most would appreciate such a conversation. The primary aim of this study was to establish the predictive validity of the Surprise Question in older hospitalized patients. Its secondary aims were to assess whether the validity of the Surprise Question is different between physicians and nurses, between patients aged >80 and <80 years, or improves by combining answers and adding age.

Methods

A secondary analysis was conducted of a cohort study in hospitalized patients aged >60 years. In these patients, the Surprise Question was answered by physicians and nurses independently. Exclusion criteria included presence of delirium; life expectancy <1 week; and palliative care team already involved. To validate the Surprise Question, the 1-year survival since date of Surprise Question assessment was verified in the medical file. Methodical, statistical, and ethical considerations can be found in the Supplementary Material.

Results

A total of 308 patients were included. Mean age was 80.8 years (SD 8.5); 152 (49%) were female. One hundred seventeen patients (38%) died within 1 year after Surprise Question assessment. One-year mortality and Surprise Question scores are presented in Table 1.

The positive predicted value of the Surprise Question was <50% for both physicians and nurses, whereas the negative predicted value was high (>85%). Sensitivity was deemed excellent for physicians and nurses alike with values around 90%, whereas specificity was deemed poor (Table 1).

Chi-square analyses on the Surprise Question scores revealed a significant difference between physicians and nurses (P < .001, Supplementary Table 1). The absolute agreement was 87%; the Kappa 0.69.

Regression analyses showed that for both physicians and nurses, the Surprise Question was a significant predictor for 1-year mortality (Supplementary Table 2, model 1-4), with areas under the curves (AUCs) of 0.66 for physicians and 0.65 for nurses, respectively. When the Surprise Question scores of physician and nurse were combined, the odds ratio for 1-year mortality increased to 8.86 (3.86-20.31) in cases where there was agreement on a negative Surprise Question score. The AUC was 0.68. The fourth model, which showed this combined physician and nurse score, but expanded with age, revealed an odds ratio of 7.03 (2.98-16.58), and a significant effect for age >80 years, with an odds ratio of 1.73 (1.01-2.99). The AUC was 0.71.

Discussion

This study investigated the validity of the Surprise Question in a population of older hospitalized patients, and we appear to be the first to have investigated the predictive validity of combined Surprise Question scores of nurses and physicians. Two “no” responses were associated with an 8.86 times increased likelihood of dying in the next 12 months. Adding age increased the AUC from 0.68 to 0.71. Therefore, combining the Surprise Question scores of physicians and nurses and adding age appears to be a promising (first) step to identify older hospitalized patients in their last year of life.

It has been reported elsewhere that doctors seem to be more accurate than nurses in recognizing patients in their last year of life, but that is in contrast with the evidence presented here, where only the chi-square analysis revealed any significant difference between their respective scores. Because this difference did not result in differences in performance, we can only attribute it to an equal distribution of error over both groups.

Two recently performed reviews have concluded that the Surprise Question on its own performs poorly to modestly in specific populations (ie, renal or heart failure, cancer) as a predictive tool for death. The available evidence on the Surprise Question in older hospitalized patients generated mixed results, in line with our results. An explanation could be that the trajectory of functional decline at the end of life in especially frail older patients is less predictable compared to patients with organ failure or a terminal illness.

M.T. and F.J.H.M. contributed equally.

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Table 1
Predictive Validity of the Surprise Question in Older Hospitalized Patients (N = 308)

| Surprise Question | Died Within 1 y | Alive | Total n (%)
|-------------------|-----------------|-------|-----------
| **Physicians**    |                 |       |           |
| Yes, surprised     | 13              | 84    | 97 (32)  |
| No, not surprised  | 104             | 107   | 211 (68) |
| **Nurses**        |                 |       |           |
| Yes, surprised     | 10              | 70    | 80 (26)  |
| No, not surprised  | 105             | 121   | 226 (74) |
| **Physicians and nurses** | | | |
| Both surprised     | 7               | 62    | 69 (22)  |
| 1 surprised, 1 not surprised | 9           | 30    | 39 (13)  |
| Both not surprised | 99              | 99    | 198 (65) |

Missing data for nurses: 2.
Positive predicted value: 49.3%/46.5%, negative predicted value: 86.6%/87.5%, sensitivity 88.9%/91.3%, specificity: 44.0%/36.7% for physicians/nurses, respectively.

Further Reading References

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References
### Supplementary Table 1

Agreement on Surprise Question Scores Between Physicians and Nurses

<table>
<thead>
<tr>
<th>Surprise Question</th>
<th>Nurse</th>
<th>Yes, Surprised</th>
<th>No, Not Surprised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, surprised</td>
<td>69</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>No, not surprised</td>
<td>11</td>
<td>198</td>
<td></td>
</tr>
</tbody>
</table>

Missing data nurses: 2. Chi-square = 148.9 (df 1) \( P < .001 \).

### Supplementary Table 2

Regression Analysis and AUC for the Surprise Question

<table>
<thead>
<tr>
<th></th>
<th>Physicians</th>
<th>AUC (95% CI)</th>
<th>Nurses</th>
<th>AUC (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td></td>
<td>0.66 (0.60-0.73)</td>
<td></td>
<td>0.65 (0.59-0.71)</td>
</tr>
<tr>
<td>SQ (neg.)</td>
<td>6.28 (3.30-11.95)</td>
<td></td>
<td>6.07 (2.98-12.38)</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.16</td>
<td></td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Model 2</td>
<td></td>
<td>0.70 (0.65-0.76)</td>
<td></td>
<td>0.68 (0.62-0.74)</td>
</tr>
<tr>
<td>SQ (neg.)</td>
<td>5.18 (2.67-10.03)</td>
<td></td>
<td>4.82 (2.30-10.09)</td>
<td></td>
</tr>
<tr>
<td>Age (&gt;80 y)</td>
<td>1.93 (1.13-3.29)</td>
<td></td>
<td>1.84 (1.08-3.15)</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.12</td>
<td></td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Model 3</td>
<td></td>
<td>0.68 (0.62-0.74)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQ (both pos.)</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQ (1 neg. and 1 pos.)</td>
<td>2.66 (0.90-7.82)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SQ (both neg.)</td>
<td>8.86 (3.86-20.31)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 4</td>
<td></td>
<td>0.71 (0.65-0.77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQ (both pos.)</td>
<td>Reference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQ (1 neg. and 1 pos.)</td>
<td>2.24 (0.75-6.71)</td>
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</tr>
<tr>
<td>SQ (both neg.)</td>
<td>7.03 (2.98-16.58)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (&gt;80 y)</td>
<td>1.73 (1.01-2.99)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>0.10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

neg., no response; OR, odds ratio; pos., yes response; SQ, Surprise Question.

Separate analyses of the AUCs for patients aged >80 and <80 years revealed that the performance of the SQ was slightly better for patients aged <80 years: for physicians, the AUCs were 0.68 (0.57-0.78) for age <80 years vs 0.61 (0.53-0.69) for age >80 years, and for nurses the AUCs were 0.70 (0.60-0.80) and 0.57 (0.49-0.65), respectively.

\( ^* P < .001 \)

\( ^* P < .05 \)