OBJECTIVES

- In the last decade there are clearly important changes in the surgical approach of gastric cancer treatment due to an increased interest in the minimally invasive surgery.
- The objective of the study was to compare the main operative and clinical outcomes and to assess the incremental cost-effectiveness ratios (ICERs) of the two techniques.

METHODS

- Design: This is a clinical and cost-effectiveness analysis within a prospective comparative study of Robotic Gastroctomy (RG) and Open Gastroctomy (OG) conducted at HM Sanchinarro University Hospital from 2015 to 2019.
- Costs (€) from payers perspective, QALYs and incremental-cost-effectiveness-ratios (ICER) were calculated.
- ICER was estimated using overall costs of the RG and OG procedures and QALYs derived from patient interviews, in order to find the incremental cost per QALY gained.
- QALYs were used to measure effectiveness. QALYs were estimated for 1 year following the procedure for each patient using the medical outcomes study SF-36 questionnaire.
- The cost-effectiveness plane was used to represent all pairs of solutions of the model.
- A cost-effectiveness acceptability curve was computed, which plots the probability that the RG was cost-effective relative to OG.
- A sensitivity analysis was carried out in order to propagate the uncertainty of the estimations to the results of the model.
- We use a multivariate and stochastic sensitivity analysis performed by 5000 Monte Carlo simulations.
- A willingness-to-pay of 20,000€ and 30,000€ per QALY gained as a threshold to recognize which treatment was most cost-effective.

RESULTS

<table>
<thead>
<tr>
<th>Table 1: Patients Baseline Characteristics</th>
<th>Robotic (n=25)</th>
<th>Open (n=25)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)*</td>
<td>65.12±5.4</td>
<td>67.86±5.4</td>
<td>0.21</td>
</tr>
<tr>
<td>Sex: M/F (%)</td>
<td>55.3±4.4</td>
<td>75.6±5.2</td>
<td>0.25</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>21.8±2.3</td>
<td>22.5±2.5</td>
<td></td>
</tr>
<tr>
<td>ASA</td>
<td>5 (25)</td>
<td>4 (20)</td>
<td></td>
</tr>
<tr>
<td>Tumor location</td>
<td>6 (30)</td>
<td>5 (25)</td>
<td></td>
</tr>
<tr>
<td>TNM stage</td>
<td>15 (75)</td>
<td>14 (70)</td>
<td>0.33</td>
</tr>
<tr>
<td>Perioperative CT (%)</td>
<td>0.77</td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>Utility</td>
<td>4.2</td>
<td>4.2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Financial Data Stratified by Approach</th>
<th>Robotic (n=25)</th>
<th>Open (n=25)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization Cost</td>
<td>5,753.02</td>
<td>4,493.75</td>
<td>0.569</td>
</tr>
<tr>
<td>Operative Cost</td>
<td>8,471.99</td>
<td>7,711.56</td>
<td>0.008</td>
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<tr>
<td>Laboratory Cost</td>
<td>1,534.65</td>
<td>734.23</td>
<td>0.224</td>
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<tr>
<td>Radiology Cost</td>
<td>238.46</td>
<td>152.85</td>
<td>0.061</td>
</tr>
<tr>
<td>TOTAL COST</td>
<td>15,807.13</td>
<td>13,343.84</td>
<td>0.771</td>
</tr>
<tr>
<td>Utility</td>
<td>0.744</td>
<td>0.678</td>
<td>0.706</td>
</tr>
<tr>
<td>Incremental Results</td>
<td>-4713.26</td>
<td>-4651.18</td>
<td>-4775.31</td>
</tr>
<tr>
<td>Incremental Utility (Qaly)</td>
<td>0.038 (0.0373; 0.0386)</td>
<td>Dominated</td>
<td></td>
</tr>
<tr>
<td>ICR (€/Qaly)</td>
<td>0.038 (0.0373; 0.0386)</td>
<td>Dominated</td>
<td></td>
</tr>
</tbody>
</table>

CONCLUSIONS

- The cost-utility analysis showed that RG resulted in a small increase in QALY compared with OG, and the estimated ICER for patients was dominated by the robotic approach.
- Probabilistic sensitivity analysis estimated by Monte Carlo simulations demonstrated that the probability that the robotic approach was cost-effective was 94.04% and 94.20%, respectively, at a WTP threshold of 20,000€ and 30,000€ per QALY gained.
- RG is safe, technically feasible and oncologically safe when compared to open resections.

REFERENCES