Predictors for Discharge After Robotic Hysterectomy – A Retrospective Analysis

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Overview of the Literature

The robotic-assisted techniques are minimally invasive and have become increasingly common today in gynecological surgery. According to the literature, there are several advantages of robotic-assisted surgery, such as reduced intraoperative blood loss, decreased postoperative pain and recovery time, decreased postoperative urinary complications, and better cosmetic result. Robotic techniques have a positive financial impact on reduction of operative costs and of hospital length of stay [5]. The literature search revealed articles including, for example, a meta-analysis with regards to liberal ( intra op. from 2750 to 3380 mL; post op. from 1500 to 2900 mL) vs. restrictive perioperative ( intra op. from 998 to 2740 mL; post op. from 500 and 2170 mL) fluid therapy [6], a discussion paper regarding the need for an enhanced recovery program (ERP) for patients with endometrial cancer having robotic surgery [7], and a review which investigated the outcomes of various fluid administration regimens in elective surgical procedures [8]. The articles found were not specific to the elective robotic hysterectomy population and varied in their recommendations with regards to the amount of IV fluid that should be administered. A few authors also recommended the need for proper procedure specific studies to define optimal perioperative fluid management [4,6,7].

Methods

Data were retrieved from the electronic health records (EHRs) including all patients age ≥ 18 and who had a robotic hysterectomy between dates 1/1/17 and 12/31/17. The sample (IRB #1166256-1) was comprised of patients with procedure codes: 1070002913, 1070002914, 1070002918, 1070002919 and 345. The demographic characteristics of the sample (N=519) are described below (Table 1).

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>57.53 years</td>
<td>12.70</td>
</tr>
<tr>
<td>BMI kg/m2</td>
<td>32.1</td>
<td>9.24</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>67.1 kg</td>
<td>25.19</td>
</tr>
<tr>
<td>Length of stay (h)</td>
<td>Min. 0.03 days</td>
<td>Max. 4.2 days</td>
</tr>
</tbody>
</table>

The retrieved variables included also: total volume of intravenous fluid (mL), intra-operative time (i.e. time in OR to time out of OR), urine output (OR), post – void residual (bladder scan), nausea, vomiting, anti-nausea medications and dose(s), pain medications (dose and frequency), and estimated blood loss (in mL).

Statistical Analysis

Statistical differences between categories were estimated by Kruskal-Wallis Rank Sum Test, Pairwise Wilcoxon Rank Sum Test, and Fisher’s Exact Test.

Results

The analysis uncovered three groups: ‘early discharge’ (ED ≤0.49 days), ‘mid-discharge’ (0.5 days ≤MD ≤1.49 days) and ‘late discharge’ (LD ≥1.5 days). ED included 32.5%, MD 63.5%, and LD 4.0% of patients. (Figure 1.)

Significant differences were found between the groups as shown in Table 2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Early Discharge</th>
<th>Mid-DischARGE</th>
<th>Late Discharge</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of surgery (Min)</td>
<td>177.5 min</td>
<td>207.5 min</td>
<td>226 min</td>
<td>&lt;.000</td>
</tr>
<tr>
<td>Post anesthesia care unit stay (h)</td>
<td>0.94 days</td>
<td>1.15 days</td>
<td>1.46 days</td>
<td>&lt;.000</td>
</tr>
<tr>
<td>Time from the end of procedure to voiding (h)</td>
<td>1.72 h</td>
<td>3.83 h</td>
<td>4.69 h</td>
<td>&lt;.000</td>
</tr>
<tr>
<td>Total amount of IV fluids</td>
<td>1450 ml</td>
<td>1907 ml</td>
<td>3958 ml</td>
<td>&lt;.000</td>
</tr>
<tr>
<td>Net fluid volume</td>
<td>1396 ml</td>
<td>1500 ml</td>
<td>2867 ml</td>
<td>&lt;.000</td>
</tr>
</tbody>
</table>

Nausea was infrequently acknowledged; emesis was more often documented in the MD group (6.28%, n=300, p<.000) than in the ED (1.26%, n=6) and LD groups (1.05%, n=5).

Predictors of LOS were ‘duration of surgery in minutes’ (Coefficient: -0.01, OR 0.99, p<.000), ‘time from end of procedure to patient voiding’ (Coefficient: -8.58, OR 0.90, p<.000) and ‘total amount of IV fluids’ (Coefficient: -0.0002, OR 0.999, p<.027).

Conclusions and Next Steps

A patient’s LOS can be impacted for various reasons. The literature supports the results from our study that IV fluid therapy and length of surgery are predictors for LOS. This study also found a third predictor, ‘time from end of procedure to patient voiding’.

The more recent studies have focused on the factors influencing a patient’s readiness for discharge. A prior study from our hospital has also recommended the ‘Enhanced Recovery After Surgery (ERAS) Pathway for robotic hysterectomy patients which can significantly increase the same day discharge rate. [2] The findings from this study are informing the next steps, a quality improvement initiative with the gynecology/oncology providers.

References