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Investigation of the association between surgeon sex and laparoscopic device ergonomic strain in gynecologic surgery

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OBJECTIVES: Laparoscopic instruments are known to contribute to the ergonomic injury of surgeons. Laparoscopic devices have largely been designed as one-size-fits-all, however, women surgeons have reported an increased odds of physical strain from use of these devices. Our objective was to assess if female sex is associated with greater reported ergonomic strain with use of 4 advanced energy laparoscopic devices in gynecologic surgery (Ligasure, HALO PKS, ENSEAL, and Harmonic scalpel).

MATERIALS AND METHODS: Gynecologic surgeons were surveyed through the Society of Gynecologic Surgeons listserv and through 4 Obstetrics and Gynecology departmental listservs. The primary outcome was the presence of physical complaints or discomfort attributed to the use of laparoscopic devices. Descriptive statistics were used to compare surgeon characteristics and the presence of ergonomic symptoms between female and male surgeons. Logistic regression was performed with adjustment for surgeon characteristics to identify an association between surgeon sex and physical symptoms related to laparoscopic device use.

RESULTS: The response rate was 45%, comprising 145 women (79%) and 38 men (21%). Women compared to men had significantly younger age (mean 34 vs 40 years old, \( P < 0.01 \)), smaller glove size (mean 6.3 vs 7.5, \( P < 0.01 \)), shorter height (median 66 vs 71 in, \( P < 0.01 \)), and were less frequently in practice for >10 years (19% vs 47%, \( P < 0.01 \)). Women significantly more often reported physical complaints or discomfort related to use of laparoscopic devices (79% vs 45%, \( P < 0.01 \)). The Ligasure, HALO PKS, ENSEAL, and Harmonic scalpel were all reported significantly more often by women to have too large a fit for appropriate use (\( P < 0.01 \)). Women were found to have 4.7 times the odds of physical complaints or discomfort attributed to the use of laparoscopic instruments (\( \text{cOR} = 4.7, 95\% \text{ CI} = 2.2-10.1 \)); with adjustment for glove size, height, age, and level of experience was no longer significant (\( \text{aOR} = 1.9, 95\% \text{ CI} = 0.6-6.5 \)).

CONCLUSION: Women significantly more often experience physical complaints with use of and report inappropriate fit of the Ligasure, HALO PKS, ENSEAL, and the Harmonic scalpel. Surgeon sex is associated with significantly greater odds of physical complaints with laparoscopic device use, however other surgeon demographic and anthropometric characteristics may in part explain this relationship. It will be critical to experimentally investigate the strain encountered by surgeons with device use in order to fully understand the factors related to surgeon strain and injury.

Table 1. Crude and adjusted odds ratios by surgeon sex (female vs male).

<table>
<thead>
<tr>
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<th>Crude OR (95% CI)</th>
<th>Adjusted OR* (95% CI)</th>
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<tbody>
<tr>
<td>Presence of physical complaints or discomfort attributed to use of laparoscopic devices (Ligasure, HALO PKS, ENSEAL, Harmonic)</td>
<td>4.7 (2.2, 10.1)</td>
<td>1.9 (0.9, 6.5)</td>
</tr>
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*Adjusted for: age, glove size, height, level of experience

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Racial and ethnic disparities in complications after apical support and sling procedures- national trends over time: A secondary analysis of the national surgical quality improvement program database

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OBJECTIVES: Racial and ethnic disparities in complications rates after FPMRS procedures exist. Prior studies have shown that Black women have higher complication rates than other racial and ethnic groups; however, it is not known whether these complication rates have changed over time. We sought to compare 30-day complication rates after apical support and sling procedures across racial/ethnic groups, and evaluate trends over time.

MATERIALS AND METHODS: Using a nationally validated, outcomes-based database we identified women who underwent apical support procedures and/or sling procedures between 2014 and 2018 using CPT codes, and stratified by race and ethnicity into four groups (1. Black, 2. White, 3. Hispanic, and 4. Other). Complication rates were calculated based on frequency of any complications reported in the 30-day postoperative period. Group comparisons were performed using one-way analysis of variance (ANOVA) to compare complication rates between groups. Multivariable logistic regression was used to adjust for operative year, age, BMI, diabetes, and hypertension requiring medication.

RESULTS: We identified 51,921 surgeries with apical support procedures and 15,409 sling procedures over the five-year period. Among women who underwent apical support procedures, complication rates differed between racial and ethnic groups with the highest complication rates noted in Black women at 11.5% (Table 1). There were few significant differences in complication rates between racial and ethnic groups.