Multiple comparisons and analyses show no consistent effect of famotidine on death among COVID-19 hospitalized patients

**INTRO:**

- Famotidine (Pepcid®), a histamine-2 receptor antagonist, has been posited as a potential treatment for COVID-19.
- Existing evidence has been limited to single-institutional explorations of small samples with varying statistical methods and inconsistent results.
- Compared the incidence of COVID-19 outcomes among famotidine user’s vs Proton pump inhibitors (PPIs), Hydroxychloroquine (HCQ), or Famotidine non-users.

**METHODS**

- A retrospective cohort study using data from COVID-19 Premier Hospital Database.
- The three exposure: Patients dispensed any medication containing one of the three drugs on the day of admission.
- Non-user group: Patients with no history of exposure to any drug with famotidine prior to or on the day of admission.
- Intention-to-treat: starting 1 day to 30 days after admission.
- Fit a propensity score model through large-scale regularized logistic regression. And utilized diagnostics to evaluate potential bias.

**RESULTS**

- Diagnostics showed different covariate distribution across different exposure cohorts.
- For example, compared to PPI users, prior to propensity score adjustment, famotidine users were younger and had fewer comorbid conditions.

**DISCUSSION:**

- Prior findings, both for positive and no association, could be potentially attributed to confounding and selection bias in comparator selection, two sources of systematic error that our study captured through diagnostics and sought to address through large scale PS adjustment.

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**Table 1. Populations size**

<table>
<thead>
<tr>
<th>Comparator</th>
<th>Patients</th>
<th>death events</th>
<th>T</th>
<th>C</th>
<th>T</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Famotidine vs. PPI</td>
<td>1,527</td>
<td>1,855</td>
<td>196</td>
<td>282</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Famotidine vs. HCQ</td>
<td>1,186</td>
<td>5,047</td>
<td>159</td>
<td>686</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Famotidine vs. non-users</td>
<td>1,623</td>
<td>24,404</td>
<td>214</td>
<td>3923</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 2: Relative risk of death for famotidine after PS stratification**

- No famotidine: 1.03 (0.82-1.18)
- PPIs: 1.14 (0.94-1.39)
- Hydroxychloroquine: 1.03 (0.85-1.24)