Stability of Unit Dose Preparations of Sublingual Nitroglycerin Tablets in the Health System Setting

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Background

- Limited data are available on the stability of sublingual nitroglycerin (SLN) tablets, including no data within the inpatient environment.
- The package insert recommends SLN tablets be stored in the original glass vial container due to degradation in the presence of moisture and air.
- In 2018, Nawarskas et al demonstrated that SLN tablets retained potency when stored in simulated “real-life” conditions (e.g., 25°C/40% relative humidity, 40°C/60% humidity, purse, pocket) over at least a 12 month period. These results suggest modern preparations may be preserved outside the original container for extended periods.
- In the inpatient setting, accurate inventory control of SLN tablets in automated dispensing cabinets (ADC) is difficult due to misplaced/lost vials.
- SLN is required in certain emergent situations including acute coronary syndrome.

Methods

- For this open-label study, SLN tablets were packaged at Olathe Medical Center into two separate preparations:
  - Manual process utilizing Medi-Dose system blister cards
  - Automated process with Talyst® JVM Auto Pack Machine
- After packaging, preparations will be stored within a Cerner RxStation® ADC. Compartment humidity and temperature will be checked three times weekly.
- Two common manufacturer products Pfizer (PZR) branded, Greenstone Labs (GSL) generic are being tested to increase generalizability.
- Purity testing on Days 0, 30, 90, 180, and 365 after packaging will occur via ultra-performance liquid chromatography with ultraviolet detection (UPLC-UV) at the University of Kansas Medical Center.
- Potency assessment to occur along a 5 point calibration curve from 25 – 125% resulting in an average coefficient of variation of 2.5%

Purpose

We seek to investigate the stability of two SLN tablet products using two different unit-dose packaging methods over a 12 month timespan.

Preliminary Results

- Forced Degradation Control
  - 48% loss of potency over 43 hours at 50°C in open container
- Day 0 (Packaging Day): Relative Standard Potency
  - PZR: 99 +/- 2.2%
  - GSL: 100 +/- 3.2%
- Day 0 ADC storage conditions: 31% humidity, 76.6°F

Day 30 Results

<table>
<thead>
<tr>
<th>Process</th>
<th>GSL</th>
<th>Pfizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>101 ± 4.4%</td>
<td>98 ± 4.4%</td>
</tr>
<tr>
<td>Automated</td>
<td>42 ± 3.1%</td>
<td>39 ± 3.6%</td>
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<tr>
<td>Manual</td>
<td>92 ± 3.8%</td>
<td>92 ± 3.9%</td>
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Possible Future Implications

- If tablet stability can be demonstrated in unit-dose packaging preparations, commercial packaging solutions will be warranted.
- Unit-dose packaging may allow for tighter inventory control throughout the inpatient medication use system.
- Cost savings may be possible through overall decreased purchase of drug/wastage.

References


Disclosure: Nothing to Disclose

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