Pharmacist-driven Fluid Stewardship Recommendations Related to Hidden Fluids in Medically Critically Ill Adults

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REFERENCES

CONCLUSIONS

RESULTS

BACKGROUND

- Intravenous fluids (IVF) are the most frequently administered drugs in the intensive care unit (ICU) and should be used with caution due to the risk of fluid overload, which is associated with increased mortality and organ dysfunction.
- Hidden fluids are defined as fluids administered as part of routine care, the volumes of which are not explicitly prescribed (e.g., medication diluents, intravenous flushes).
- Hidden fluids have been demonstrated to account for 40 to 60% of daily fluid administration in the ICU and thus can cause or exacerbate fluid overload.

- Purpose: Identify what proportion of pharmacist-driven recommendations are related to hidden fluids.

STUDY DESIGN

- Design: IRB-approved, retrospective, single-center cohort study.
- Setting: Community teaching hospital.
- Inclusion Criteria:
  - Critically ill adults admitted to the medical ICU.
  - Followed by the academic rounding team.
  - Pharmacy documentation in TheraDoc®.
- Methods:
  - Data was collected by reviewing documentation of pharmacist recommendations in the medical record.
  - Each recommendation was assessed for relevance to fluid stewardship and was further stratified based on relevance to hidden fluids and by the ROSE model.
- Statistical Plan:
  - Descriptive statistics were used to report all outcomes.

OUTCOMES

- Primary: Percentage of pharmacist recommendations that were related to hidden fluids.
- Secondary: Characterization of hidden fluids according to specific recommendations including:
  - Conversion of medications from IV to non-IV route.
  - Discontinue/adjust volume of enteral fluid.
  - Concentrate intravenous infusions.
  - Adjust volume of parenteral nutrition.

RESULTS CONTINUED

RESULTS

Figure 1. Screening and Recommendation Type

<table>
<thead>
<tr>
<th>350 Patients</th>
<th>905 Patient Days</th>
<th>2,730 Pharmacy Recommendations</th>
<th>531 Fluid Stewardship Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>19% of all pharmacist recommendations were related to fluid stewardship</td>
</tr>
</tbody>
</table>

Figure 2. Recommendations Related to Fluid Stewardship

- 337 (63%) Other
- 194 (37%) Hidden Fluids

Figure 3. Number of Fluid Recommendations per Patient

- 194 (37%)
- 337 (63%)

Table 1. Types of Hidden Fluid Recommendations

<table>
<thead>
<tr>
<th>Recommendation Type</th>
<th>Number (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convert medications from IV to non-IV route</td>
<td>151 (78%)</td>
</tr>
<tr>
<td>Discontinue/adjust volume of enteral fluid</td>
<td>39 (20%)</td>
</tr>
<tr>
<td>Concentrate intravenous infusion</td>
<td>3 (&lt; 2%)</td>
</tr>
<tr>
<td>Adjust volume of parenteral nutrition</td>
<td>1 (&lt; 1%)</td>
</tr>
</tbody>
</table>

* Definition of recommendations classified as hidden fluids were defined by investigators a priori

Figure 4. Fluid Stewardship Recommendations Stratified by ROSE Model

- 88 (16%)
- 418 (79%)
- 191 (98%)

Figure 5. Hidden Fluid Recommendations Stratified by ROSE Model

- 21 (4%)
- 21 (4%)

CONCLUSIONS

- More than one-third of all pharmacist-driven fluid stewardship recommendations were related to hidden fluids.
- Pharmacist should consider hidden fluids as a routine assessment of patient care to help mitigate the consequences of fluid overload.
- This study was limited by its single-center nature and the use of a singular reviewer to characterize recommendations.
- Future research should examine the relationship between fluid-related recommendations and patient outcomes.

REFERENCES

