Compounding individualized pediatric parenteral nutrition during the week-end: how to optimize the process?

Abstract

Objectives

To analyze if individualized parenteral nutrition (PN) prescribed and produced every day during the week-end has a clinically significant relevance because of changes in the formulation justifying a daily compounding by the pharmacy during the week-end.

Background

• Individualized compounding of PN is offered for daily adaptation to clinicians in our pediatric hospital.
• This proposition has a high impact on pharmacy workload and costs, due to safety, quality and laboratory controls, and mostly during the week-end days.

Methods

• Setting:
  Retrospective collect of week end compounded PN (Friday to Sunday) during 2 periods of 8 months: March to October 2015 and 2016.

• STUDY DESIGN:
  Implementation of nutritional teaching’s program in 2016 with elearning module for prescribing physicians.
  PN prescription sequences selected and defined as
    • Unplanned: PN prescribed every day during the week end, with or without any change.
    • Planned: PN prescribed on Friday for the 3 week end days.
  Clinically day-to-day formulation changes defined as a significant change by a pediatric gastro-enterologist and a neonatologist.

• OUTCOME:
  Number of PN with at least one significant change in the formulation during the week-end in the unplanned PN.
  To analyze the possible associated factors for unplanned PN prescriptions without significant changes in the formulation.

Results

• 32 physicians prescribed 306 PN during the week-end:
  • 2015: 163 prescriptions
  • 2016: 143 prescriptions
  ➔ 252 prescriptions were unplanned during the WE

1) Differences between planned and unplanned prescriptions:
  • Period of unplanned PN prescriptions:
    • 2015: 51.1%  →  p=0.004
    • 2016: 42.9%
  • Median weight of patients for unplanned PN prescriptions:
    • 2.4kg vs 11.1kg  →  p=0.001
  • Unit for unplanned PN prescription:
    • Ped. intensive care unit: 81.4%

2) Only 42/252 (16.6%) unplanned PN prescriptions had one significant change as defined in the formulation.
  • No associated factor was found

3) Most frequent changes in the formulation:
  • Glucose: 55%
  • Phosphate: 38%

Background

No conflict of interest to declare

Conclusion

• 75% of PN compounded during the WE are unplanned and mainly for the intensive care unit and the smaller patients.
• Only 16.6% of the unplanned prescribed PN have significant changes justifying the daily compounding by the pharmacy.
• Planned PN prescription for non intensive care units will be economically evaluated as next step.

Table

<table>
<thead>
<tr>
<th>Significant change</th>
<th>Glucose</th>
<th>Amino-acid</th>
<th>Sodium</th>
<th>Potassium</th>
<th>Magnesium</th>
<th>Calcium</th>
<th>Phosphate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+/− 0.1g/kg/24h</td>
<td>+/− 0.1g/kg/24h</td>
<td>+/− 0.5mmol/l/24h</td>
<td>+/− 1mmol/l/24h</td>
<td>+/− 0.5mmol/l/24h</td>
<td>+/− 0.1mmol/l/24h</td>
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