Medication during (adult) PN - What issues should be considered?

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Medication during (adult) PN - What issues should be considered?

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Session overview

• Medicines for the PN patient

• Medicines affecting PN prescription and *vice versa*
  A Medicines providing nutrients/energy
  B Medicines affecting nutrient requirements
  C PN components affecting medicines

• Medicine compatibility with PN

• Practice recommendations (conclusion)
Medicines for the PN patient
Review and assessment

• Medicine charts are important!
  - Route of administration (tolerance to oral / IV intake)
  - Septicaemia (antimicrobial therapy)
  - Is it a nutritional problem or a side-effect?

• Medicines related to IV access
  - pre-treatment of IV catheters to PN
  - flushing of IV catheters with PN
  - Other IV catheter procedures with PN
    ESPEN PN Guidelines, EPIC 2
    ESPEN PN Guidelines, EPIC 2
    JPEN 1998
    Prescribing Adult Intravenous Nutrition
Medicines affecting PN prescription and *vice versa*

A Medicines providing nutrients/energy

B Medicines affecting nutrient requirements

C PN components affecting medicines
Fluid

Rationalise fluid from medicines and PN

- May not be able to reduce PN volume
  - e.g. stability
  - additional time
  - greater risk
  - greater cost

Medicines affecting PN prescription and *vice versa*: A Medicines providing nutrients/energy

P Austin 2011
Medicine compatibility with PN
### Morphine

Y-site compatibility as a 1:1 mixture with:

<table>
<thead>
<tr>
<th>2-in-1 PN</th>
<th>30mg/ml morphine <strong>stable</strong> for 24h with #189 at 22°C 1mg/ml morphine stable for ≥2h with #131, #132, #203, #204, #212 to #215 (range 23-25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-in-1 PN</td>
<td><strong>15mg/ml morphine unstable</strong> with immediate damage to emulsion integrity with #218 to #226 1mg/ml morphine stable for 4h with #218 to #226 at 23°C</td>
</tr>
</tbody>
</table>

*Handbook on Injectable Drugs 2011*
Heparin Sodium

Y-site compatibility as a 1:1 mixture with:

- **2-in-1 PN**  
  100 units/ml heparin **stable** without change in measured turbidity or increase in particle content in 4h at 23°C with #212 to #215

- **3-in-1 PN**  
  100 units/ml heparin **unstable** with immediate damage to emulsion integrity with free oil formation possible with TPN #218 to #226

Handbook on Injectable Drugs 2011
Gentamicin sulphate

Direct compatibility with:

2-in-1 PN

80mg/l gentamicin **stable** for 24h with #1, #4, #5, #7 and #10 at 22°C (antibiotic potency for at least 12h with #1 #10)

80mg/l gentamicin **unstable** with a precipitate in 8 to 24h with #2, #3, #6, #8 and #9 at 22°C

Handbook on Injectable Drugs 2011
Ceftriaxone

Direct compatibility with:

2-in-1 PN 1000mg/l ceftriaxone stable for 24h with #107 at 21°C
Handbook on Injectable Drugs 1994

Y-site compatibility as a 1:1 mixture with:

3-in-1 PN 20mg/ml ceftriaxone stable (in D5W) with #218 to #226 in 4h at 23°C
Handbook on Injectable Drugs 2011
Medicine compatibility

- It really is not as simple as it might seem!
- If you are going to mix drugs and PN
  - need clear indication
  - no other option
  - clear practice policy
  - check the *original* ‘supporting’ reference
  - check for any other references, guidelines or updates that may influence your decision
PN compatibility data

- Does the data refer to what you’re considering?
  - what type of PN does the data refer to?
    (USA usually refers to TNA for 3-in-1 PN and TPN for 2-in-1 PN)
  - have you checked the original data source?
  - is the formulation tested applicable?
    (consider the pH of the amino acid source)
PN compatibility data

- Does the data refer to what you’re considering? (cont.)
  - is the data for mixing directly into the PN or for Y-site compatibility?
  - when will the PN be prepared if direct mixing? (what if you infuse PN over longer than 24 hours?)
  - have you considered all the available information?
Conclusion
Practice recommendations

• Consider carefully all prescriptions and their influence on PN prescribing

• Do not mix medicines and PN without very clear policies, protocols and specialist advice

• Never prescribe PN from an office!
References

- ESPEN PN Guidelines [Clinical Nutrition 2009; 28(4)]
- EPIC 2 [J Hosp Inf 2007; 65S: S33–S49]
- JPEN 1998; 22: 242-244
- Prescribing Adult Intravenous Nutrition (Pharmaceutical Press 2007)
- Handbook on Injectable Drugs (ASHP, 2011)
- J of Ped Gast and Nut 1989; 8: 491-495
- Handbook on Injectable Drugs (ASHP, 1994)
- Ann Pharmacother 2008; 42: 1914

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