

EVALUATION OF THE APPROPRIATENESS OF PRESCRIBING OF THE INTRAVENOUS COMBINATION AMOXICILLIN/CLAVULANATE IN A TEACHING HOSPITAL

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BACKGROUND

- Inappropriate use of antibiotics appears to be an increasing problem with important consequences on both antibiotic resistance and hospital costs.
- Amoxicillin/clavulanate (Augmentin[®]) is the most used antibiotic in Europe and at the Mont-Godinne teaching Hospital.

OBJECTIVE

- To evaluate the appropriateness of prescribing of the intravenous combination amoxicillin/clavulanate according to local guidelines.

METHODS

Design :

- Prospective, observational study.

Setting :

- The study was conducted at the Mont-Godinne teaching Hospital, a 450-bed Belgian institution.
- All wards were included, except paediatric and intensive care units.
- All patients receiving therapeutic or prophylactic intravenous Augmentin[®] 1g/200mg or 2g/200mg between March 23 and April 24, 2009 were enrolled.
- Data were collected by a pharmacist and the appropriateness of antibiotic treatment/prophylaxis was analysed in collaboration with an infectious diseases specialist according to local recommendations. The guideline developed for intravenous-to-oral switch is described in Table 1.

Outcome measures :

- Primary outcome measure: to evaluate the appropriateness of indication, dosage, intravenous-to-oral switch and duration of treatment/prophylaxis.
- Secondary outcome measure: to estimate the potential annual savings for the hospital by avoiding unnecessary/excessive intravenous and/or oral treatments in three selected respiratory tract infections.

Table 1:
Inclusion and exclusion criteria for intravenous-to-oral switch

| Inclusion criteria | Exclusion criteria |
|--|---|
| <ul style="list-style-type: none"> Evidence of clinical improvement Temperature less than 38°C for at least 24h CRP and white blood cell count in diminution or normalized No signs of malabsorption Oral fluid and food tolerated Ability to take oral medication | <ul style="list-style-type: none"> Severe sepsis Vomiting Severe diarrhea Swallowing disorder Infection requiring intravenous route of administration (osteomyelitis, deep abscess, meningitis, endocarditis, ...) |

Abbreviations:
 - IV: Intravenous
 - CRP: C-Reactive Protein
 - CAP: Community-Acquired Pneumonia
 - COPD: Chronic Obstructive Pulmonary Disease

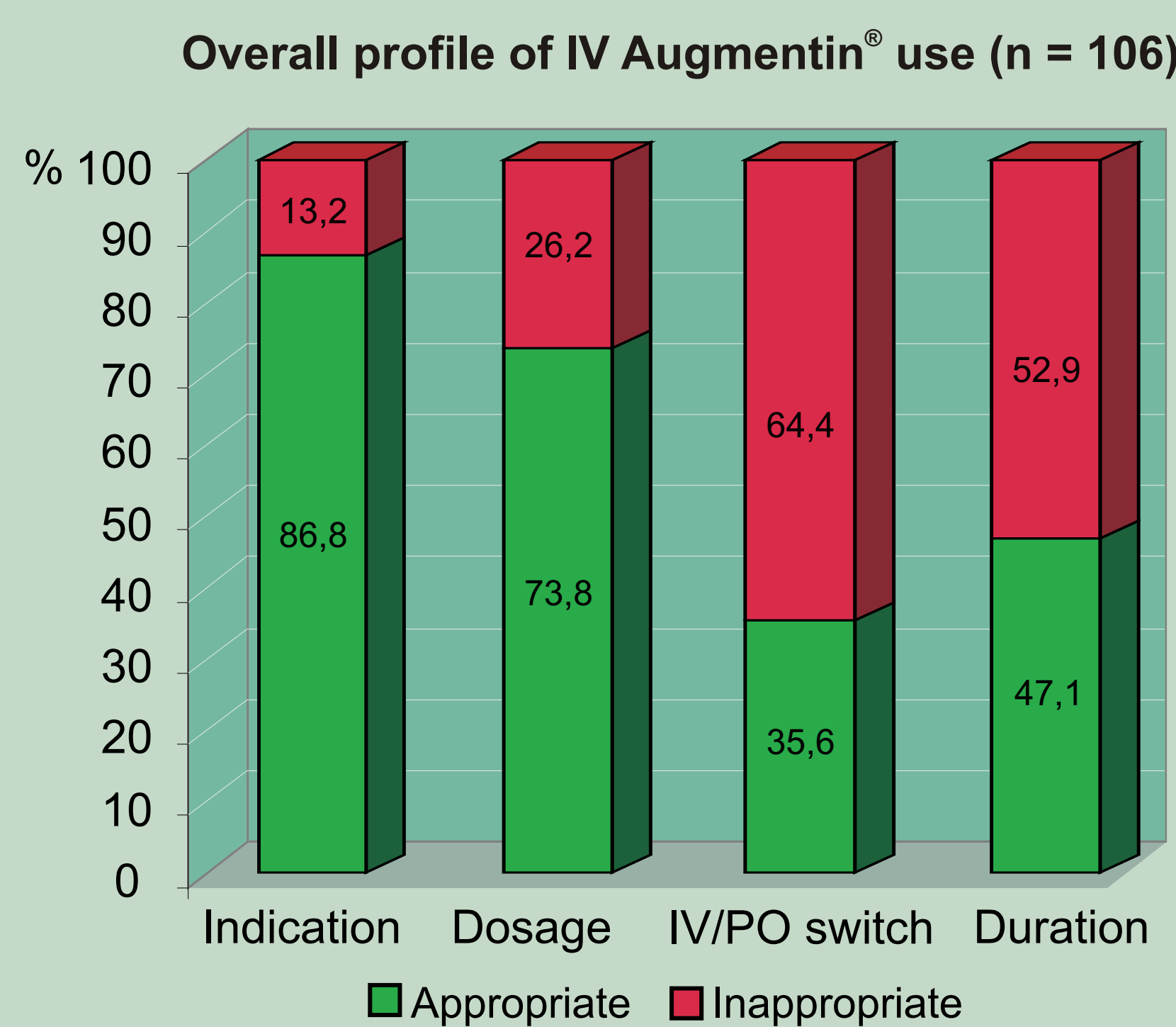
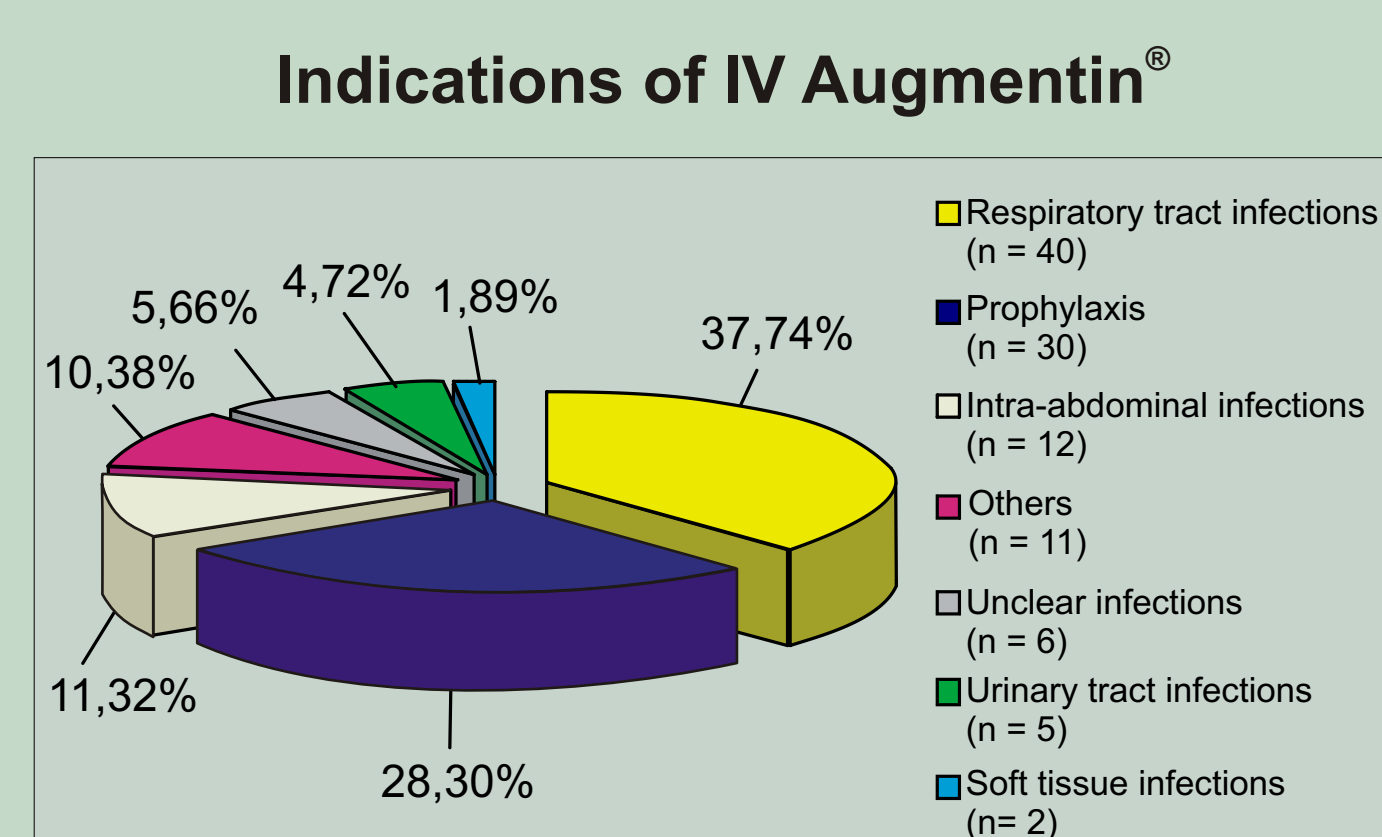
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RESULTS

- One hundred and six patients were evaluated (Figure 1).
- Overall, 43.4% of IV Augmentin[®] prescriptions were fully appropriate and 56.6% had at least one inappropriate criterion.



- Given the high percentage of inappropriate use in respiratory tract infections, the potential savings were calculated for community-acquired pneumonia, bronchitis and acute exacerbation of chronic obstructive pulmonary disease. The results showed that the hospital could save around 9,000 € per year if the use of IV Augmentin[®] was appropriate within the considered care units in terms of dosage, intravenous-to-oral switch and duration of treatment, when it is indicated (Table 2).

Table 2:
Losses and potential savings in three respiratory tract infections (CAP, bronchitis and exacerbation of COPD)

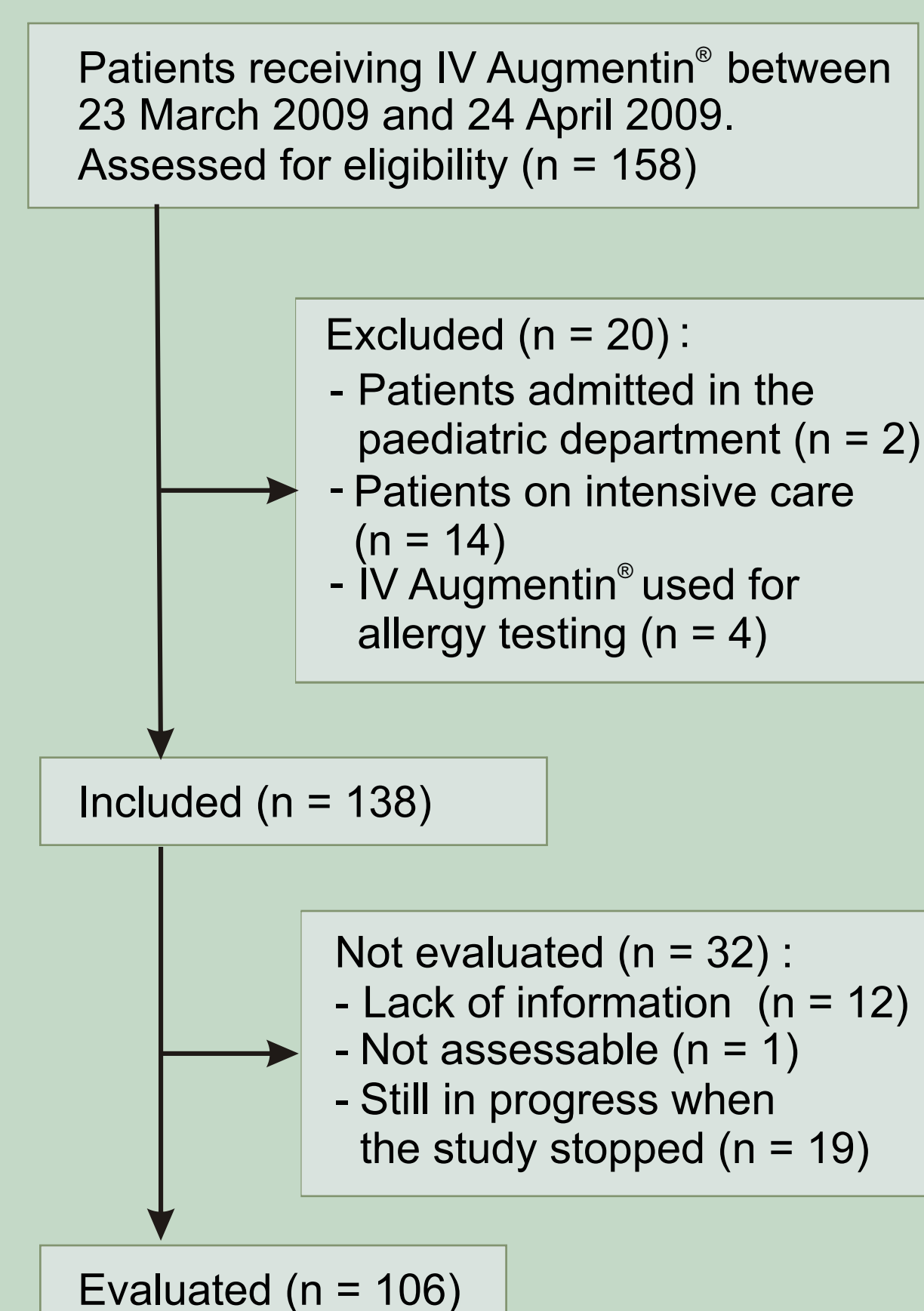
| Wards | n* | Losses** (5 weeks period) | Mean losses/patient | Potential annual savings (52 weeks) | Total potential annual savings |
|------------------------|----|---------------------------|---------------------|-------------------------------------|--------------------------------|
| Pneumology | 7 | 215.18 € | 30.74 € | 2237.87 € | 8981.24 € |
| Oncology | 7 | 326.62 € | 46.66 € | 3396.85 € | |
| Geriatrics | 3 | 63.47 € | 21.16 € | 660.09 € | |
| Haematology | 2 | 49.07 € | 24.53 € | 510.33 € | |
| Cardiovascular surgery | 1 | 70.48 € | 70.48 € | 732.99 € | |
| Otorhinolaryngology | 1 | 36.12 € | 36.12 € | 375.65 € | |
| Orthopaedics | 1 | 39.50 € | 39.50 € | 410.80 € | |
| Gastroenterology | 1 | 34.34 € | 34.34 € | 357.14 € | |
| Digestive surgery | 1 | 28.80 € | 28.80 € | 299.52 € | |

* Number of patients with one of the three respiratory tract infections for whom cost savings could have been made.
 ** Σ (cost of prescribed treatment - cost of treatment in agreement with local guidelines)

Costs of pharmaceutical forms:
 • IV amoxicillin/clavulanate 1g/200mg = 3.01€ ;
 • IV amoxicillin/clavulanate 2g/200mg = 4.06€ ;
 • amoxicillin/clavulanate tablet 500mg/125mg = 0.26€ ;
 • amoxicillin/clavulanate tablet 875mg/125mg = 0.70€ ;
 • amoxicillin/clavulanate tablet 1g/62.5mg = 0.37€



Figure 1:
Flowchart of patients included in the study



CONCLUSION

- Only approximately one out of two prescriptions was prescribed appropriately.
- This study identified two main areas for improving Augmentin[®] prescribing: (1) intravenous-to-oral switch, which is often too late or nonexistent ; (2) duration of therapy, which is too long particularly in respiratory tract infections
- The results will be presented to clinicians to increase their awareness on this issue.
- The final aim is the implementation of specific interventions at the Pharmacy Department in order to optimize Augmentin[®] prescribing.