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Without antibiotics 1-2 years

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Although antibiotics are mainly used in the primary care, hospitals are considered to be the centre of antimicrobial resistance due to high density of broad-spectrum antibiotic use both in children and adult population.

To analyse antibiotic prescribing tendencies and their usage in hospitalised children treatment as a first step to improve antibiotic usage at the hospital.

Background
- Antibiotics are among the most frequently prescribed drugs in children.
- Although antibiotics are mainly used in the primary care, hospitals are considered to be the centre of antimicrobial resistance due to high density of broad-spectrum antibiotic use both in children and adult population.

Objectives
- To analyse antibiotic prescribing tendencies and their usage in hospitalised children treatment as a first step to improve antibiotic usage at the hospital.

Methods

A retrospective, analytic observational study. Evaluated patients were aged 0-18 years and were consecutively admitted to the Infectious diseases unit from January 1st to February 28th, 2011. Antibiotic usage was analysed within the following age groups: <1 year, 1-2 years, 2-5 years, 5-12 years, and 12-18 years.

For each child, information was obtained from full-text medical charts. The following data were collected: age, gender, weight, diagnosis, used systemic antibiotics (ATC J01), dose per administration, number of doses per day, route of administration, the day of hospitalisation (when antibiotic treatment started), duration of the treatment, number of days spent at hospital, and microbiology data.

The dose examination was done for each antibiotic prescription. As a guideline British National Formulary for Children 2010—2011 was used. The drug license information was obtained from the summary of product characteristics available on the State Agency of Medicines of Latvia website.

Results

- In total, 609 (307 females and 302 males) of hospitalised children were evaluated.
- Antibiotics were prescribed for 294 (48%) of patients (134 females and 160 males).
- The majority of children treated with antibiotics (130; 44%) fell in the group of age between 2 and 5 years.
- The average duration of the hospital stay was 5.7 days.
- Respiratory tract infections (pneumonia, bronchitis) were the most common indications for antibiotic usage.
- The most used course length for ampicillin was 3 days (the average length was 4.70 days).
- For cefotaxime – 7 days (the average length was 5.86 days).
- In total, there were 3% off-label prescriptions (mainly Co-trimoxazole).
- 97% of prescriptions had a correct dose, but 3% had a lower dose than recommended.
- During the study period there was no antibiotic prescription that had a higher dose than recommended.
- Co-trimoxazole was prescribed more often under the recommended minimum dose than other drugs.
- There was no ‘unclassified’ or ‘unregistered’ use of antibiotics.
- 179 (61%) of 294 children received antibiotics based on clinical signs of possible infection, but without any microbiological confirmation.

This study indicates several problem areas and targets for quality improvement:
- the high proportion of parenteral antibiotics which can be associated with vascular line infections, prolonged hospital stay, increased costs and also inconvenience to patients;
- a high use of broad-spectrum antibiotics and especially the third generation cephalosporins (cefotaxime). This is not a problem only in Latvia, but also in other European countries. [1, 2]. The use of the third generation cephalosporins must be reduced and these antibiotics should be prescribed only in accordance with guidelines;
- more than a half of antibiotics were prescribed on an empiric basis. There are available studies that show similar results [3, 4].

Our study shows the same tendencies as Ekins-Daukes S study [5], i.e. antibiotic prescription at less than the recommended dose occurred less frequently than the dose, which was higher than recommended (in our study the higher dose was in 0% cases, Ekins-Daukes’ study - 1.6%).

This study shows similar results with the Porta’s study [6] that of-label use relates to doses and indications, but rarely to age.

Results of this study differ from some other researches done in Europe. E.g. German study where macrolides were most frequently prescribed for children aged 0-6 years, followed by trimoxazole (7%) and Italian and Danish study where amoxicillin plus enzyme inhibitors and trimoxazole were most frequently used antibiotics: first one in Italy, second – in Denmark [8].

The high usage of the third generation cephalosporins corresponds with European Surveillance of Antibiotic Consumption point prevalence survey results [9].

The limitation of the study could include following aspects: antibiotic prescription and usage were analysed only in the Infectious diseases unit and the sample size may not represent all paediatric units in Latvia. At the same time January and February are months, when patient admission is one of the highest. And the highest number of children is treated in Children University hospital in Riga (in regional and local hospitals in Latvia there are only few paediatric units with a small number of patients).

CONCLUSIONS

- Further studies of the antibiotic use and prescription tendencies not only in the Infectious diseases unit, but also in other hospital departments as well as in other paediatric units in adult hospitals in Latvia, are necessary.
- The development of local guidelines for antibiotic use in children treatment should be recommended urgently.
- In addition, physicians and parents should receive additional education in prudent prescribing and usage of antibiotics.

BIBLIOGRAPHY