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#### INDICATOR OF ANTIBIOTIC USE IN PUBLIC PHARMACY CHAIN BELGRADE

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**OBJECTIVE:** Is to analyze trends in prescription habits and rational use of antibiotics in different population groups, as well as expenditure data regarding drug policy changes. **METHODS:** We used database from Public pharmacy chain—Pharmacy Institution Belgrade (1.5 M population) with conventional data grouping and database analysis. All information on antibiotics was based on prescriptions which were reimbursed by local Health Insurance Fund (HIF). The calculations included: DDD methods, monetary cost for months, quarters and years level (2004–2005). **RESULTS:** The use of antibiotics expressed in DDD/1000 inhabitants/day units reveals that in Belgrade population the most prescribed antibiotic is amoxicillin during two years (4.77 in 2004; 4.37 in 2005). The biggest increase has been shown in the use of azithromycin (from 0.25 in 2004 to 0.75 in 2005). Expenditure of antibiotics was analyzed between six population groups (three children's, two work ages, one senior) and expressed as % of all antibiotics used. The highest financial cost has been found in group of 19–50 years old in both years with levels 26.11% and 32.27% respectively. The first three antibiotics with highest financial share (monetary cost in % of all antibiotics) are cefalexin 27.46%, erythromycin 17.73%, amoxicillin 13.57% (2004); cefalexin 21.06%, erythromycin 14.59%, azithromycin 14.11% (2005). **CONCLUSIONS:** Analysis and evaluation of the data has shown that there had been increase in expenditure of antibiotics in these periods particularly in age group 19–50. The biggest increase is notified in the use of azithromycin both in financial values and DDD units, conducted by drug policy changes (reimbursement list). Monitoring of the antibiotics use in longer period can provide further useful information about rational use of this group of medicines.

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#### THE USE OF ANTIBIOTICS IN CHILDREN POPULATION IN BELGRADE REGION

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**OBJECTIVE:** To analyze trends in prescription habits and rational use of antibiotics in three subgroups of children population and to make evaluation in terms of the most used antibiotics. **METHODS:** All information on antibiotics are based on prescriptions that were reimbursed by local Health Insurance Fund (HIF). We used database from Public pharmacy chain of Belgrade, corresponding to population of 330,338 children, grouped in three following subgroups: A- 0–2 years; B- 3–8 years; C- 9–18 years. The calculations included: monetary cost for months, quarters and years level (2004–2005) and DDD methodology (unit: DDD/1000 inhabitants/day). **RESULTS:** Expenditure of antibiotics expressed as percentage of all used antibiotics during two years, shows that a third of the overall financial value was spent in children population (32.97% in 2004 and 29.42% in 2005). The highest financial use is in group B (16.21% in 2004 and 14.24% in 2005). The use of antibiotics evaluated by DDD unit reveals that in Belgrade region children used erythromycin most of all antibiotics (A-2.86; B-5.48; C-2.42 in 2004 and for subgroups A-2.38, B-4.21 and C-1.55 in 2005). The biggest increase has been shown in the use of azithromycin from the value of A-0.13; B-1.74; C-0.85 in 2004

to the value of subgroups A-1.74, B-4.33 and C-2.57 in 2005. In these periods the consumption of amoxicillin was almost equal. **CONCLUSIONS:** Analysis and evaluation of the data has shown that there had been decrease in expenditure of antibiotics but consumption (volume rate) is still too high for children population. The biggest volume increase is notified in the use of azithromycin and it is conducted by drug policy changes (reimbursement list). Use and prescription of antibiotics is still very soft controlled, therefore it is necessary to monitor processes of drug management in the wider frame.

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#### LONG TERM EFFECT OF WARD PHARMACY CONTROLLED ADMINISTRATION OF ANTIBIOTICS ON ANTIMICROBIAL TREATMENT COSTS

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**OBJECTIVES:** Antimicrobial agents are responsible for approximately one-quarter of the drug costs in hospitals. Since parenteral antibiotics are more expensive than oral antibiotics and are also associated with higher administration costs, the route and method of administration of antibiotics largely determine the total costs of antimicrobial treatment. The long term effectiveness of intravenous (IV) push administration of antibiotics in combination with an early switch from parenteral to oral antibiotics, within a ward-pharmacy organized program with the goal to reduce costs of antimicrobial treatment, was evaluated from the hospital perspective. **METHODS:** Ward Pharmacy Controlled (WPC) administration of antibiotics was introduced on a 40 bed internal medicine ward in a 700-bed teaching hospital. The costs of administration and utilization of parenteral and oral antibiotics included in the program were compared before (1997 to 1999) and after (2000 to 2004) implementation of WPC administration of antibiotics. **RESULTS:** Excluding 2004, WPC reduced utilization of parenteral antibiotics by 29%, from 3311 ± 690 to 2345 ± 377 DDD annually ( $p = 0.048$ ). Also, the percentage of parenteral antibiotics to the total DDDs of antibiotics decreased from 63 ± 5% to 53 ± 4% ( $p = 0.035$ ). Including 2004, with an exceptional high utilization of intravenous amoxicillin/clavulanic acid, the administration of parenteral antibiotics was reduced to 2507 ± 430 DDD on average annually ( $p = 0.084$ ) with a percentage to total of administered antibiotics of 55 ± 6% ( $p = 0.11$ ). The reduction of parenteral administration of antibiotics resulted in annual cost-savings ranging from EUR 14,278 up to 17,881. Administering parenteral antibiotics if possible by IV-push showed extra cost-savings ranging €3957 up to €8440 annually for the internal medicine ward. For a 700-bed teaching hospital the total cost-savings of WPC administration antibiotics amounted to at least €50,000 annually. **CONCLUSIONS:** WPC administration of antibiotics is effective in controlling and reducing costs of antimicrobial treatment.