COST BURDEN OF ROTAVIRUS GASTRO-ENTERITIS REQUIRING HOSPITALIZATIONS IN THE CZECH REPUBLIC AND IN SLOVAKIA

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Introduction

- Rotaviruses (RV) are a leading cause of gastroenteritis often associated with severe diarrhea and dehydration in infants and young children throughout the world. RV is responsible for > 1/2 of all hospital stays for acute gastroenteritis.[1]
- It was estimated that 3.6 million episodes of rotavirus disease occur annually among the 23.6 million children younger than 5 years of age in the EU, whereas every year rotavirus accounts for 231 deaths, >87,000 hospitalizations and almost 700,000 outpatient visits. Rotavirus disease constitutes a large public health burden in the EU.[2]
- Czech Republic (CR) and Slovakia (SK), former socialistic countries, form a unique region with specific health care and epidemiology characteristics. Estimates of the prevalence of RV in severe gastroenteritis are limited to inpatients; estimates among outpatients are lacking. The local evidence on the underlying epidemiology and the burden of disease therefore covered hospitalized patients only.

Objective

- The objective was to estimate the burden of community acquired rotavirus gastro-enteritis requiring hospitalization (RVGE) in children ≤ 5 years old in Czech Republic and Slovakia from the perspective of payer.

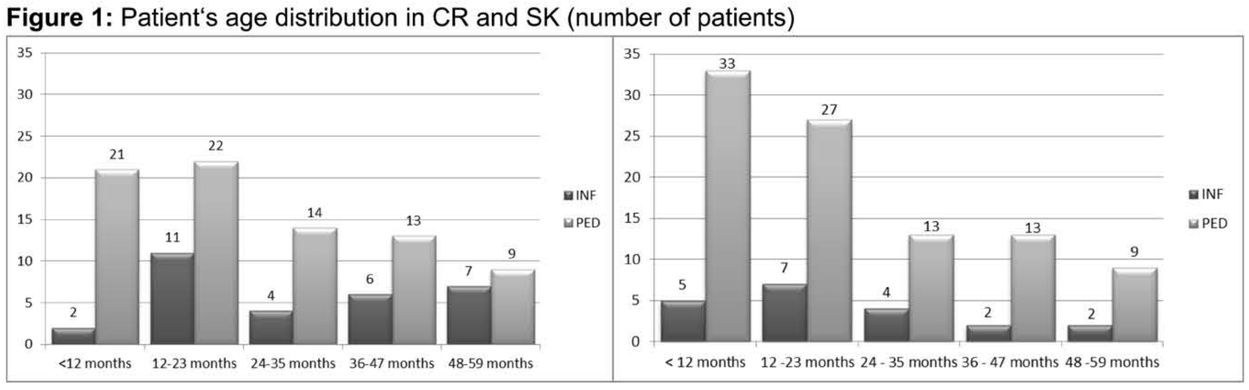
Methods

- Multi-center, retrospective, cross-sectional patient chart review was conducted in both pediatric and infection disease settings in CR and SK.
- Survey inclusion criteria involved hospitalized children <60 months of age (at diagnosis of RVGE) with confirmed rotavirus gastroenteritis by an etiology test. Nosocomial cases of RVGE were excluded.
- Due to the seasonal character of the RVGE, the study was designed to randomly select patients around the peak period (between 1st January and 31st March 2013) of RVGE.
- The analysis includes the resource use and costs associated with duration and inpatient care during hospital treatment as well as prior and after the hospitalization of pediatric patients with confirmed RVGE.
- All resources used such as the length of hospital stay, medication and tests performed were evaluated. Reported length of stay included both the first and the last day in hospital. N-1 days in hospital were considered for costing purposes. The cost of emergency care and GPP visits prior hospitalization were referred to as “pre-hospitalization”; the “admission” referred to the cost of initial examination in hospital; the “post-hospitalization” included any follow-up medical care.
- Patients requiring rehydration, complications and comorbidities were considered with respect to the additional costs as governed by the specific reimbursement policy.
- Micro-costing was done based on the resource use data. Costs were considered from the perspective of payer, based on CR and SK National Health Insurance Funds.
- Direct cost from payer's perspective were retrieved in parallel from official DRG (Diagnosis Related Groups) lists[3] (CR) and fixed hospitalization cost rates per case[4] (SK).
- Number of hospitalized RVGE cases were derived from national surveillance EPIDAT[5] (CR) and EPIS[6] (SK).

Results

- In total, 109 patients from 3 infectious disease centers (INF) and 11 general pediatric centers (PED) in CR and 115 patients from 2 INF and 12 PED centers in SK were analyzed. Patients were aged 1-60 months old in CR and 1-58 in SK. Mean (median) age of patients in CR and SK was 26.4 (23.0) and 21.4 (17.0) months, respectively.

Figure 1: Patient‘s age distribution in CR and SK (number of patients)

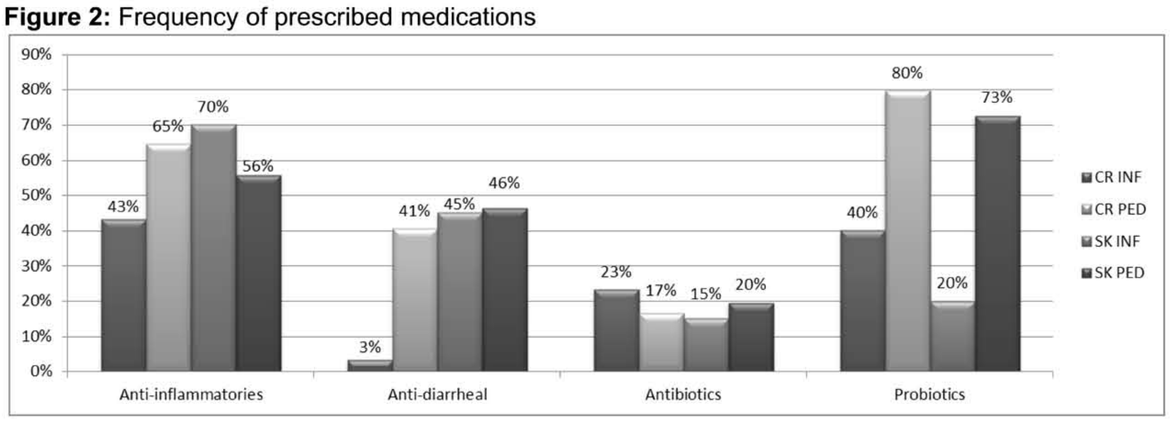


- Mean (median) length of hospital stay due to RVGE in INF and PED settings was 4.5 (4.0) and 5.0 (4.0) in CR; and 5.3 (5.0) and 5.1 (5.0) in SK.
- The majority of RVGE patients (80% in CR and 97% in SR) spent the main part of the hospital stay in general department of the respective (infectious disease or pediatric) setting. 35% (CR) and 2% (SK) of the patients stayed at intensive care unit (ICU) due to RVGE for at least 1 day. In CR, 20% of all patients spent even the major part of their hospital stay in ICU.
- Prevalent type of etiology test in INF and PED settings was latex agglutination (53% and 41%), immunochromatography (33% and 41%) and ELISA (33% and 19%) in CR. In SK, it was immunochromatography (100% and 92%) and latex agglutination (0% and 8%).
- From the other examination, biochemical tests (in about 80-90% in both countries), blood counts with differential (87% and 82%), stool culture (89% and 97%) as well as glucose (82% and 97%) and urine analyses (93% and 95%) were hugely performed.
- Comorbidities were reported in 25% (CR) and 27% (SK), the most often were bronchial problems; complications in 10% (CR) and 8% (SK). No deaths due to RVGE were reported in this survey in CR and SK.
- 34% patients (both CR and SK) visited GPP before and 72% (CR) and 82% (SK) after hospitalization; 10% and 1% were re-checked in hospital ambulance, 9% and 7% required further examination, 6% and 10% required other follow up.

Results

- Intravenous rehydration was required in 84% (CR) and 97% (SK) of cases. One patient in each country required rehydration by nasogastric tube.
- Anti-inflammatory drugs were administered in 59% (CR) and 58% (SK), anti-diarrheal drugs in 30% and 46%, antibiotics in 18% and 10%, and probiotics in 69% and 64% of patients. Differences between INF and PED settings are shown in Figure 2.

Figure 2: Frequency of prescribed medications



- Average total cost per RVGE case by micro-costing (Figure 3) was in INF settings €396 (CR) and €1,127 (SK), and in PED settings €506 (CR) and €482 (SK). Direct cost structure is shown in Figure 4 and Figure 5.
- Assuming officially reported hospitalized RVGE cases (4,494 in CR and 2,557 in SK) and the same proportion of INF and PED as in the sample, the total burden of hospitalized RVGE in children ≤ 5 years old would be € 2.14 million in CR and € 1.52 million in SK.

Figure 3: Average cost per RVGE case

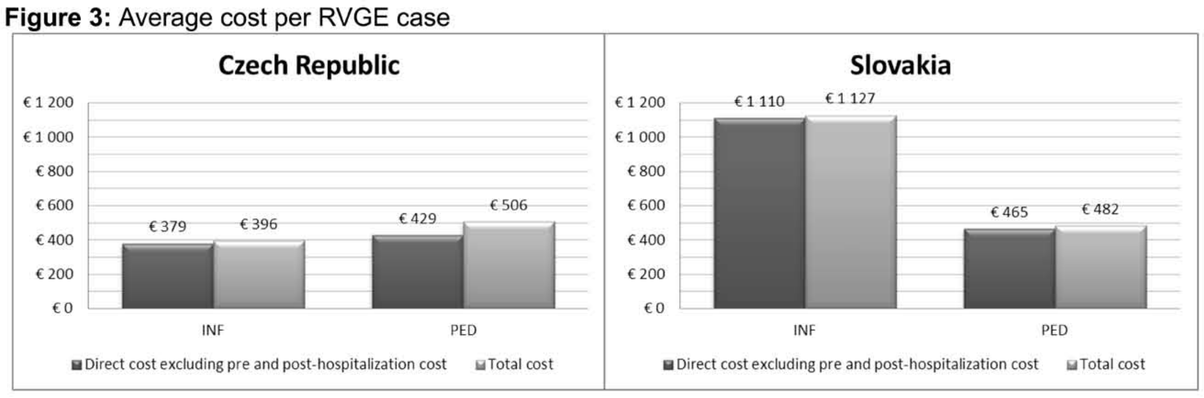


Figure 4: Direct cost structure

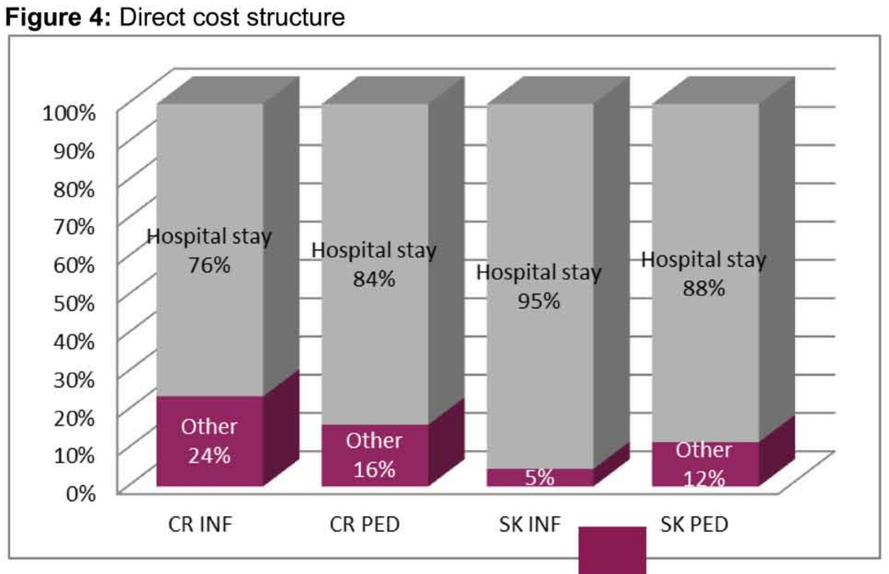
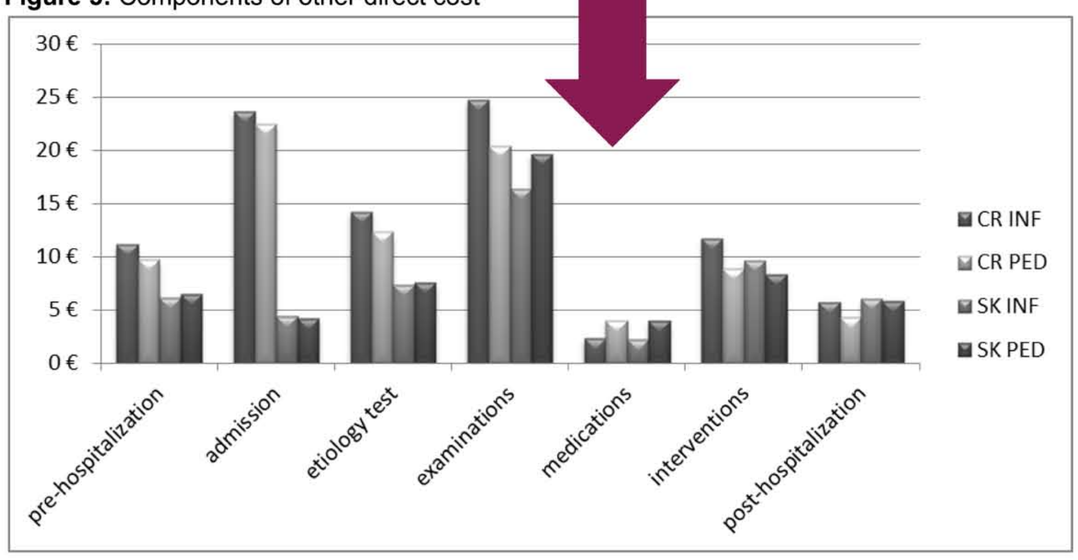


Figure 5: Components of other direct cost



- The national DRG-based reimbursement per hospitalized RVGE is €370-€645 in CR, depending on the level of complications and comorbidities present. Giving the reported complications/comorbidities, the average DRG reimbursement per RVGE case was €483.
- The national payment per case reimbursement per hospitalized RVGE in SK is €409 in pediatric settings, €976 in infectious disease settings and €1,249 in ICU.

Conclusions

- Assuming the same proportion of INF and PED as in the sample, the total cost burden of RVGE with hospitalization in children ≤ 5 years old was €2.14 million in CR and €1.52 million in SK. The major cost item was the hospital stay. Other cost contributions were rather minor.
- Taking average DRG reimbursement in CR lead to very similar burden of disease amounted to €2.17 million .

 # PIH13 **ISPOR 16th Annual European Congress: Dublin, Ireland, November 2-6, 2013**

**GlaxoSmithKline Biologicals SA funded this study and was involved in all stages of study conduct, including analysis of the data. GlaxoSmithKline Biologicals SA also took in charge all costs associated with the development and publication of this presentation.*

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