

Epidemiology and etiology of hospitalised acute gastroenteritis following introduction of RV vaccination in Estonia

Kadri Kõivumägi¹, RV Study group¹, Irja Lutsar¹

¹Department of Microbiology, University of Tartu, Tartu, Estonia

Background

In Estonia rotavirus gastroenteritis (RVGE) has been the most common cause for hospitalisation among children aged <5 years with hospitalisation rate 8-15 per 1000 population.

In July 2014, the pentavalent bovine-derived rotavirus vaccine was implemented in the national immunisation schedule in Estonia, replaced by monovalent G1P[8] vaccine in October 2015.

Aim

We aimed to assess the influence of RV vaccination on the epidemiology and etiology of acute gastroenteritis (AGE) hospitalisations within first two years of immunisation.

Methods

- **Study design:** prospective observational study
- **Study site:** 7 largest Estonian hospitals (~80% of pediatric hospitalizations in Estonia)
- **Study time:** 01.02.2015 to 31.08.2016
- **Study population:** children aged 0-18 years hospitalised with AGE
- **Recorded study data:** demographical data, disease severity according to Vesikari, Clark severity scales and WHO dehydration scale, clinical diagnosis based on viral antigen tests and bacterial stool cultures defined by the 10th revision of the International Classification of Diseases (ICD10)

Results

During study period 2260 AGE patients were hospitalised. (Table 1)

At least one pathogen was detected in 53.4% (n=1207) of cases. Based on viral antigen tests 83% were confirmed viral infections. 70.4% (n=440) RVGE, 17.9% (n=112) norovirus GE, 11.7% (N=73) adenovirus GE in 2015 compared to 36% (n=137), 56.7% (n=215), 7.1% (n=27) in 2016. 9,8% (n=221) presented with bacterial GE and 0,6% (n=14) with non-infectious GE. (Figure 1, 2)

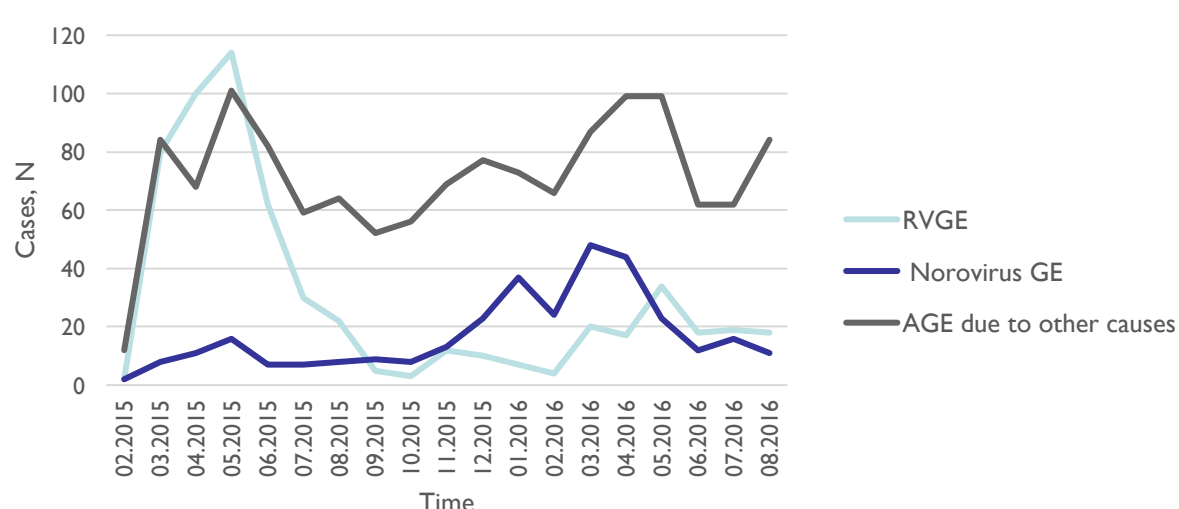


Figure 1. AGE, RVGE and NGE hospitalisations

Table 1. Characteristics of hospitalised AGE patients

Study period	01.02-31.12. 2015	01.01-31.08.2016
Hospitalised AGE Patients, N	1276	984
Age in years, median	2	2
Females, N (%)	596 (46%)	459 (46%)
Males, N (%)	680 (53%)	525 (53%)
Native speakers, N (%)	637 (50%)	462 (47%)
Vaccinated with RV vaccine, N (%)	231 (18%)	313 (32%)
Unknown vaccination status, N (%)	41 (3%)	50 (5%)

RV hospitalisation rate among children under the age of 5 during RV seasons 2015 and 2016 dropped from 5 in 2015 to 1.4 per 1000 population in 2016, with decrease among all age groups except <6 months. Non-RV AGE hospitalisation rate remained unchanged, being highest among children aged 0-11 months. (Figure 2)

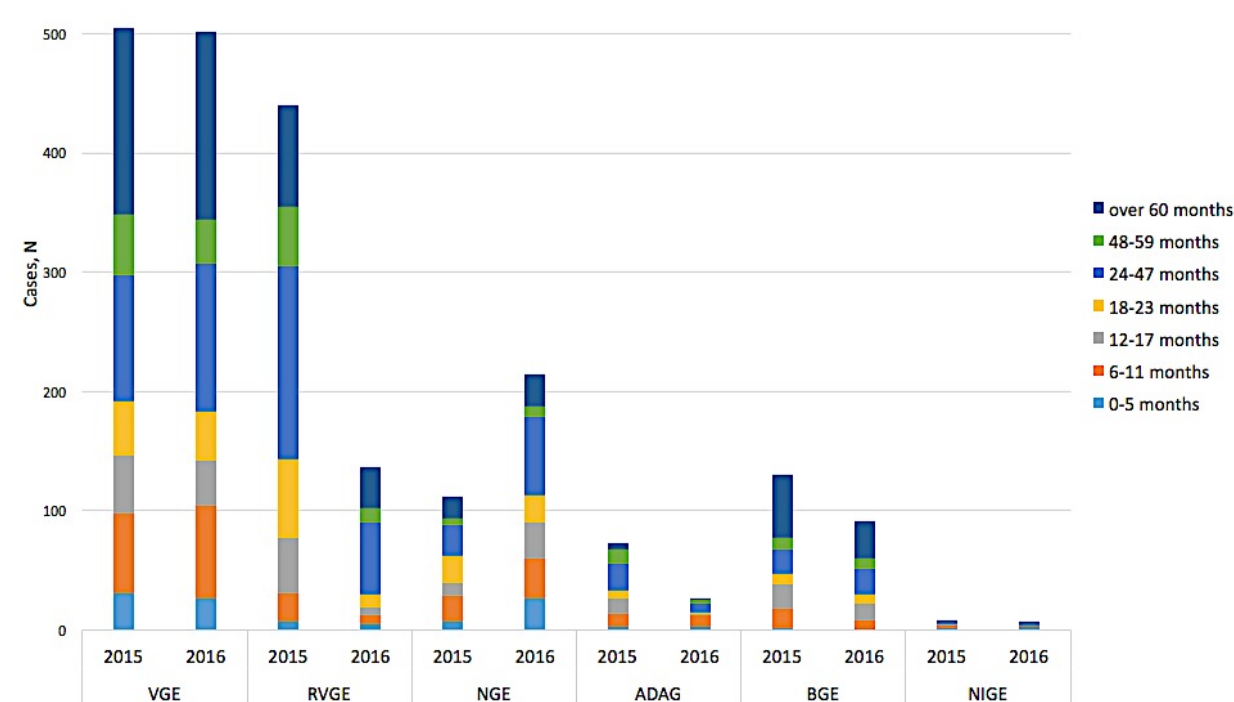


Figure 2. Epidemiology and etiology of AGE hospitalisations

Although Vesikari, Clark severity scores and WHO dehydration scale demonstrated major differences in severity interpretation, there was no significant difference in the proportion of severe RV cases. (Figure 3)

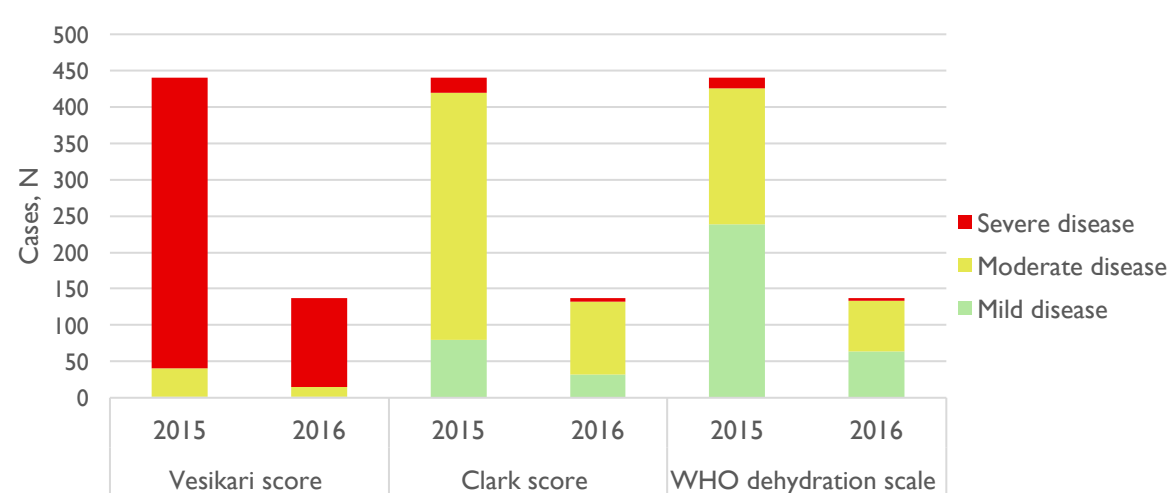


Figure 3. Severity of hospitalised RV patients

Conclusion

Following RV vaccine introduction there was remarkable decline of RVGE hospitalisations among age groups with highest disease burden, with no signs of increased morbidity among older age groups. There was upsurge of hospitalised Norovirus GE in 2016, possibly due to seasonal fluctuations.

Abbreviations:

AGE- acute gastroenteritis
ADGE- adenovirus gastroenteritis
BGE- bacterial gastroenteritis
NGE- norovirus gastroenteritis
NIGE- non-infectious gastroenteritis
RVGE- rotavirus gastroenteritis
VGE- unspecified viral gastroenteritis

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Contact:

Department of Microbiology University of Tartu
Tartu, Estonia
e-mail: kadri.koivumagi@gmail.com