ACUTE GASTROENTERITIS: INCIDENCE AND DISEASE BURDEN AMONG INFANTS WITH MEDICAL RISK CONDITIONS

J.A.P. van Dongen¹, R. Schuurman², M.J.M. Bonten^{1,2,3}, P. Bruijning-Verhagen^{1,3}. On behalf of the RIVAR study group

- 1. Julius Center for Health Science and Primary Care UMCU, Public Health, Utrecht, the Netherlands
- 2. University Medical Center Utrecht, department of Medical Microbiology, Utrecht, the Netherlands
- 3. National Institute for Public Health and the Environment, Centre for infectious disease control, Bilthoven, the Netherlands

Introduction

Infants with medical risk conditions are vulnerable to common childhood infections including acute gastroenteritis (AGE). To guide targeted prevention programs, we quantified AGE incidence, severity, and virus prevalence among rotavirus unvaccinated medical risk infants.

Figure 1. Study design
Monthly questionnaires contain questions about AGE complaints, duration and healthcare use. Of reported AGE episodes a diary and stoolsample was collected.

Methods

Design: Prospective birth-cohort study, part of the *Risk-group Infant Vaccination Against Rotavirus* (RIVAR) project in 13 Dutch hospitals

Eligibility: prematurity, low birth weight and/or severe congenital conditions

Primary outcome: AGE incidence rate (IR) up to 18 months of age, based on the number of reported episodes and additional unreported episodes identified from monthly questionnaires (Figure 1)

Secondary outcomes: AGE severity, based on Vesikari score day 1-7 (Figure 2), and AGE pathogen assessed by realtime RT-PCR for rota-, noro-, adeno (40/41)- and astrovirus

	0 Points	1 Point	2 Points	3 Points
Diarrhea duration, d	0	1-4	5	≥6
Maximal no. of diarrheal stools per 24-h period	0	1-3	4-5	≥6
Vomiting duration, d	0	1	2	≥3
Maximal no. of vomiting episodes per 24-h period	0	1	2-4	≥5
Maximal recorded fever, rectal, °C	<37.0	37.1-38.4	38.5-38.9	≥39.0
Health care provider visits	None		Outpatient ^a	ED ^b
Treatment	None	Rehydration	Hospitalization	

^a Community-based health care provider visit related to vomiting, diarrhea, fever, or fluid refusal.
^b ED health care provider visit related to vomiting, diarrhea, fever, or fluid refusal.

Figure 2. Modified Vesikari Score (MVS)

Results

Figure 3. Study flowchart

Table 2. Pathogen distribution and severity

Pathogen (N=185)	Tested positive	Severe (N=175)*
Rotavirus	34 (18%)	19 (59%)
Norovirus	45 (24%)	20 (47%)
Adenovirus	17 (9%)	7 (41%)
Astrovirus	9 (3%)	5 (56%)

* Percentage severe of number of positives/pathogen

Table 1. Baseline characteristics

Characteristic	Participant (N=466)	Non-participant (N=1377)
Gender, male (%)	269 (57.7)	729 (52.9)
Gestational age in weeks (mean, SD) [#]	32.1 (4.1)*	32.6 (4.1)*
Birthweight in grams (median, IQR) [#]	1823 (1220)	1870 (1100)
Twins (%)	108 (23.2)	301 (21.9)
Congenital disorder (%)	113 (24.2)	286 (20.8)
Number of disorders (%)		
1	83 (73.5)	237 (82.8)
2	23 (10.6)	40 (14)
>2	7 (6.2)	9 (3.1)

*Statistical significant difference (p-value <0.05)
[#] 7 respectively 5 missing

- Mean AGE IR: 74/100 person-years (py) (95% CI 67-81/100py)
- IR increased with age: 46/100py vs. 84/100py per 1-5 vs. 6-18 months, respectively
- 142 of 388 (37%) AGE episodes required any healthcare
- Severe AGE (MVS ≥11) occurred most frequently in rotavirus positive 19 (59%) episodes (Table 2)

Conclusion

The observed AGE incidence, severity and healthcare usage among medical risk infants confirms substantial disease burden. Norovirus and rotavirus are the dominant pathogens and rotavirus is most frequently severe. AGE prevention in medical risk infants should be prioritized.