Actuaciones Salud Pública para combatir el Rotavirus. Futuro de la vacunación frente a Rotavirus

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Resumen

Carga de enfermedad

Efectividad en población general

Grupos de riesgo en prematuros

Costo-efectividad

Futuro de la vacunación frente a RV

Carga de enfermedad

Table 5 Base case health outcomes under the current context and under a universal rotavirus vaccination program for a birth cohort followed until 5 years

	No rotavirus vaccination program	With rotavirus vaccination program	Avoided cases with rotavirus vaccination program	Reduction (%)
RVGE cases seeking medical care	**107,894**	**25,380**	**82,514**	**-76.5%**
Hospitalizations	14,342	3,355	10,987	-76%
Emergency visits	41,701	7,414	34,287	-82%
PCC visits	48,320	13,133	35,187	-73%
Nosocomial infections	3,530	1,477	2,053	-58%
RVGE cases not seeking medical care	73,733	20,040	53,692	-73%
Total RVGE cases	181,626	45,420	136,206	-75%
Parental work days lost	210,404	48,909	161,495	-77%

Diez-Domingo et al. BMC Public Health 2010, 10:469 Burden of paediatric Rotavirus Gastroenteritis (RVGE) and potential benefits of a universal Rotavirus vaccination programme with a pentavalent vaccine in Spain

Datos basados en el estudio REVEAL, estudio epidemiológico de 7 países europeos incluido España

Resumen

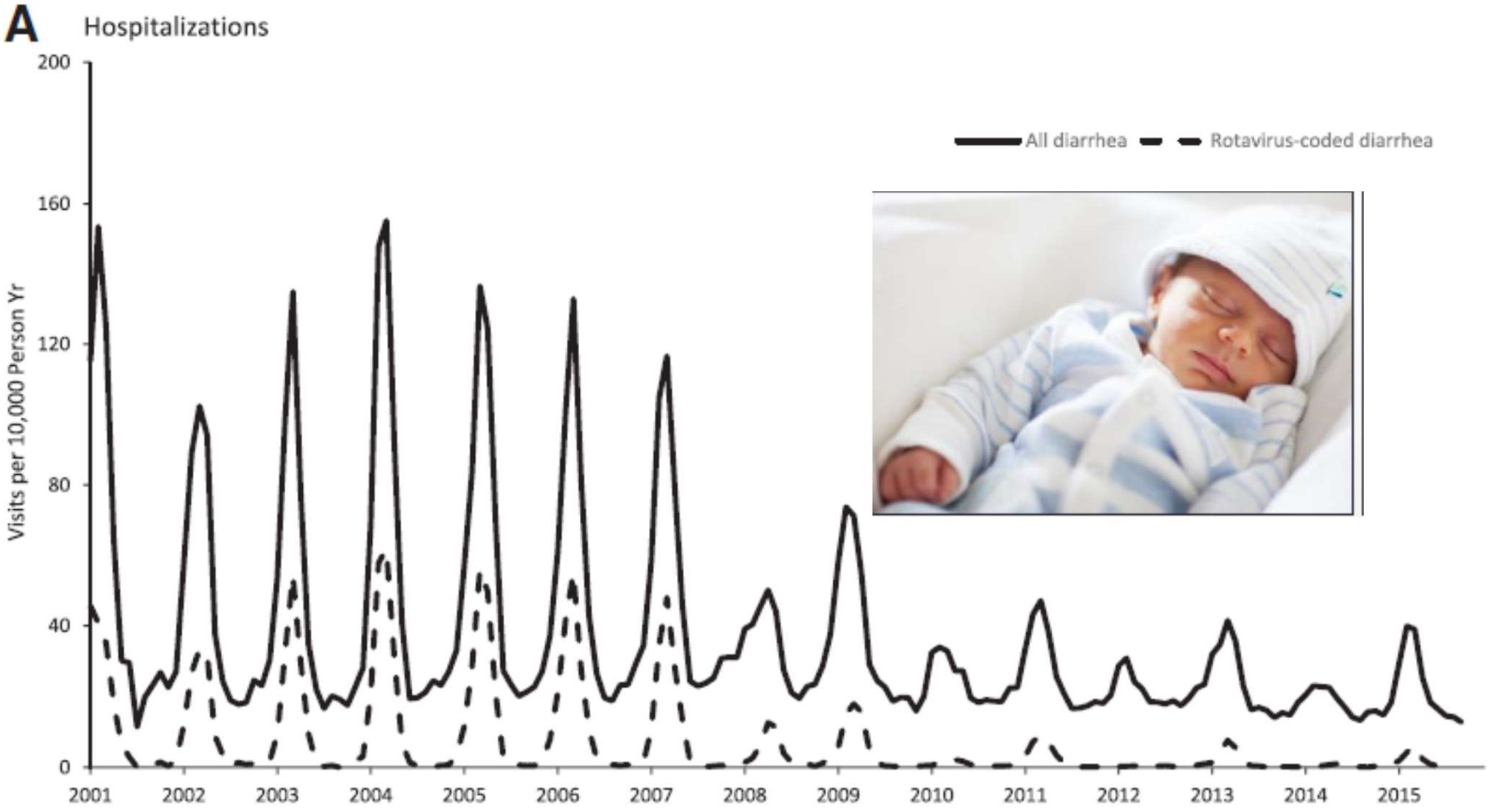
- Carga de enfermedad
- Efectividad en población general

Efectividad en Inglaterra

- RU dos años después de la introducción
- EV: 77% (IC95%: 66-85%)
  - <12 meses 85%
  - >12 meses 54%
- EV frente hospitalización
  - 35% (IC95%: -86, 77)

Vaccine: X. Volume 1, 11 April 2019, 100005
Effectiveness of oral rotavirus vaccination in England against rotavirus-confirmed and all-cause acute gastroenteritis

Impacto en hospitalización EEUU: 2001-15



Getachew HB, Dahl RM, Lopman BA, Parashar UD. Rotavirus Vaccines and Health Care Utilization for Diarrhea in US Children, 2001 to 2015. Pediatr Infect Dis J 2018; 37:943.

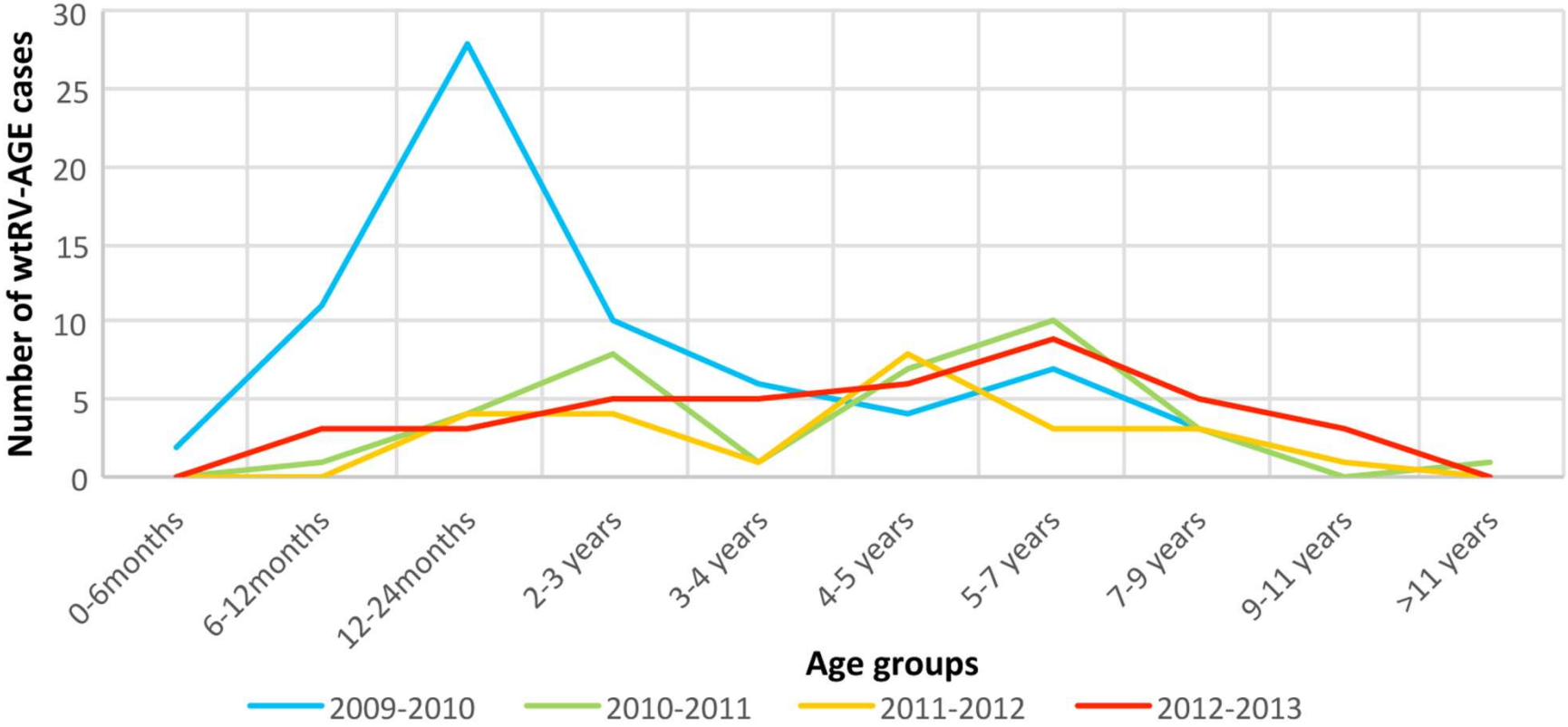
Efectividad en hospitalización EEUU: 2001-15

TABLE 2. VE and Duration of Protection among Children Who Received at Least 1 Dose of RV5 or RV1 Versus Unvaccinated Children by Age*

	Health Care Utilization Rate, n/10,000			Health Care Utilization Rate, n/10,000		
Age (mo)†	RV5	Unvaccinated‡	VE (95% CI), %	RV1	Unvaccinated§	VE (95% CI), %
Rotavirus-coded hospitalizations						
3–11	0.88	7.34	88 (86–90)	0.75	5.83	87 (80–91)
12–23	2.04	25.31	88 (86–90)	0.89	22.99	86 (80–91)
24–35	1.28	10.78	87 (85–89)	5.97	9.76	86 (79–91)
36–47	0.17	4.88	87 (85–89)	0.00	4.94	NA
48–59	2.33	3.15	87 (85–89)	0.00	2.56	NA
Diarrhea-associated Hospitalizations						
3–11	39	59	43 (40–45)	37	57	41 (36–46)
12–23	64	134	43 (40–45)	66	144	42 (37–46)
24–35	36	76	42 (40–45)	40	87	41 (36–46)
36–47	28	53	43 (40–45)	19	64	41 (35–46)
48–59	23	32	42 (39–44)	23	40	41 (34–46)

Getachew HB, Dahl RM, Lopman BA, Parashar UD. Rotavirus Vaccines and Health Care Utilization for Diarrhea in US Children, 2001 to 2015. Pediatr Infect Dis J 2018; 37:943.

Hospitalizaciones en Finlandia e Israel



- Finlandia: RotaTeq septiembre 2009
- EV frente hospitalización 94,4% (IC95%: 79,8-98,4%)
- Datos corroborados en Israel: 86% (6 a 23 meses RotaTeq)

Journal of the Pediatric Infectious Diseases Society, Volume 6, Issue 4, December 2017, Pages 317–323. Sustained High Effectiveness of RotaTeq Hospitalizations Attributable to Rotavirus-Associated Gastroenteritis During 4 Years in Finland

Rotavirus vaccines in Israel: Uptake and impact. Human Vaccines **2017 Jul 3.** Vol. 13 (7) pp. 1722-1727

Efectividad Revisión Sistemática 2006-16

Mortality/ Country	Pub. Year	Study outcome	Ages	Type of controls	Cases	Controls	OR (95% CI)	VE (CI)	REF
Low Mortality									
Australia	2010	H	35 wk-<1 yr	RV neg	28	350		89 (76, 95)	67
Finland	2013	H	<6 mo	RV neg	7	73		92 (50, 99)	68
Israel	2016	H	6-59 mo	RV neg	185	330		63 (38, 78)	51
Portugal	2014	H, ED	≤36 mo	RV neg	174	214		100 (0, 100)	56
Spain	2011	H, O	3-59 mo	RV neg	15	390		81 (68, 89)	26
Spain	2011	H, ED, O	<2 yr	RV neg	8*	130*		95 (63, 99)	27
Spain	2015	H	<3 yr	RV neg	12	Not spec.		91 (84, 95)	28
Taiwan	2014	H	8-35 mo	RV neg	184	772		97 (82, 100)	64
US	2010	H	≥6 mo	RV neg	98	153		83 (66, 91)	39
US	2010	H	15 dy-23 mo	RV neg	79	108		89 (70, 96)	52
US	2010	H, ED	2 wk-23 mo	RV neg	67	120		89 (67, 96)	69
US	2010	H	1 wk-9 mo	Non-diarr†	33140	26167		100 (87, 100)	70
US	2011	H, ED	≥ 8 mo	RV neg	402	825		92 (86, 96)	53
US	2011	H	2 mo-3 yr	Non-diarr†	54	270		92 (48, 100)	71
US	2011	H, ED	52 dy-47 mo	RV neg	143	238		84 (78, 88)	40
US	2013	H, ED	>8 mo	RV neg	79	73		92 (75, 97)	44
US	2013	H, ED	<3 yrs	Non-diarr†	76	179		92 (29, 99)	41
US	2013	H, ED	9 mo-< 5 yr	RV neg	359	1811		80 (74, 84)	29
US	2015	H, ED	1-8 yr	RV neg	402	2559		83 (66, 91)	45
US	2016	H, ED	≥8 mo	RV neg	57	55		87 (71, 94)	65
Summary								**88 (83, 91)‡**	

Figure 5. RV1 and RV5 vaccine effectiveness against rotavirus diarrhea (hospitalized, emergency department, and outpatient rotavirus-negative controls) by under-5 mortality. Abbreviations: CI, confidence interval; ED, emergency department; H, hospitalization; NA, not available; O, outpatients; RV, rotavirus; VE, vaccine effectiveness; OR, odds ratio.

Effectiveness of Rotavirus Vaccination A Systematic Review of the First Decade of Global Postlicensure Data, 2006–2016. CID 2017

Efectividad frente hospitalizaciones: Europa

Vaccine effectiveness against RVGE hospitalisations and outpatient visits, and laboratory-confirmed rotavirus infections, Europe.

Country	VE for at least 1 dose of vaccine: % (95% CI)	VE for full course of vaccine (2 doses of RV1 or 3 doses of RV5): % (95%CI)
RVGE hospitalisation		
Austria		2010: 95 (93–97) 2011:96 (95–97)
Belgium	Overall: 91 (82–95) 3–11 mo: 93 (80–97) ≥12 mo: 89 (75–95)	Overall (RV1): 90 (81–95) 3–11 mo (RV1): 91 (75–97) ≥12 mo (RV1): 90 (76–96) Severe RVGE (RV1): 91 (80–96) Mild/Moderate RVGE (RV1): 66 (31–91)
Finland		Overall (RV5): 92.1 (50.0–98.7)
Germany (Mecklenburg-Western Pomerania)		Overall: 80 (77–83) 6–17 mo: 80 (77–83) 18–29 mo: 85 (82–88)
Israel	Overall: 89.4 (51.9–97.6)	Overall: 88.9 (6.8–98.6)
Spain (Castellon)	Overall: 93.5 (30.7–99.3)	
Spain (Navarre)		Overall: 83 (65–93)
Spain	Overall: 95.6 (85.6–98.6) Overall (RV1): 97.5 (81.5–99.6) Overall (RV5):92.9 (70–98.3)	Overall: 98.3 (87.4–99.8) Overall (RV1): 97.3 (80.6–99.6) Overall (RV5): 95 (63.1–99.3)

Karafillakis E, Hassounah S, Atchison C. Effectiveness and impact of rotavirus vaccines in Europe, 2006–2014. Vaccine 2015; 33:2097–107.

Diversidad genotipos

Changes in rotavirus strain circulation have occurred after the introduction of rotavirus vaccines, but, to date, the broad effectiveness of the current vaccines appears to have limited the emergence of new strains that are resistant to vaccine-induced immunity. Nevertheless, continued vigilance by worldwide surveillance networks is warranted to ensure that this protection persists.

Bernstein D. Rotavirus Vaccines: Mind Your Ps and Gs. JID 2018:218 (15 August) EDITORIAL COMMENTARY

Resumen

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- Grupos de riesgo en prematuros

Mayor gravedad en bajo peso

Hospitalización en casos de GE por rotavirus OR=2,8 (IC 95%: 1,6-5) en <2.500 gr

Varias explicaciones:

- No transferencia anticuerpos maternos
- Sistema inmune
- Tratamientos recibidos
- Instrumentaciones

S. Esposito et al. / Vaccine 36 (2018) 5430–5434. Rotarix and RotaTeq administration to preterm infants in the neonatal intensive care unit: Review of available evidence

Mayor gravedad en prematuros y bajo peso

Prevalence of high risk conditions among RV hospitalizations and their association with disease outcome and healthcare utilization

	Hospitalización	Ingreso en UCI
EG<36 semanas	1.7 (1.2; 2.8)	7.9 (2.0; 31.1)
LBW (<2500 gr)	1.6 (1.1; 2.3)	4.7 (1.1; 20.9)
Patología congénita	4.4 (3.4; 5.4)	4.2 (1.0; 18.7)

Complex chronic conditions were those that (1) are expected to last longer than 12 months and (2) involve either several different organ systems or one organ system severely enough to require specialty pediatric care and hospitalization

Bruijning-Verhagen et al. BMC Medicine 2013, 11:112 Targeted rotavirus vaccination of high-risk infants; a low cost and highly cost-effective alternative to universal vaccination

Mayor gravedad en bajo peso

Estudio realizado en EEUU (2.001-15)

< 5 años

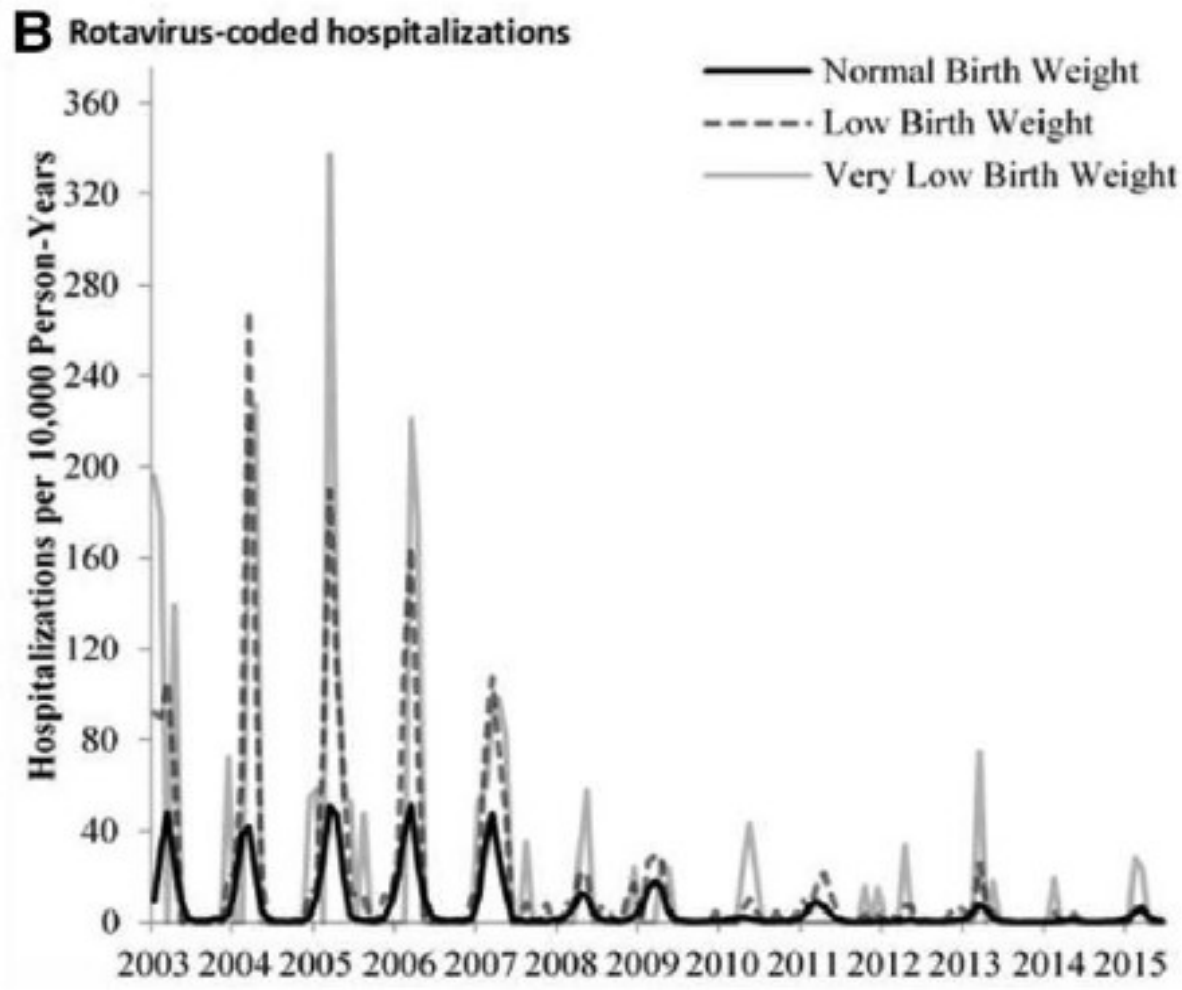
Base de datos sanitaria (Truven Health) con más de 30 millones de usuarios en 2015

Bajo peso <2500 gr, VLBW <1500 gr.

Hasta 8 veces más riesgo ingreso (very low vs. normal)

The Pediatric Infectious Disease Journal Volume 37, Number 8, August 2018. Effect of Rotavirus Vaccination on Acute Diarrheal Hospitalizations Among Low and Very Low Birth Weight US Infants, 2001–2015

Mayor gravedad en bajo peso



The Pediatric Infectious Disease Journal Volume 37, Number 8, August 2018. Effect of Rotavirus Vaccination on Acute Diarrheal Hospitalizations Among Low and Very Low Birth Weight US Infants, 2001–2015

Pero similar efectividad

TABLE 3. Annual Rates and Rate Reductions of Acute Gastroenteritis Hospitalizations Among Children 3–23 Months of Age Who Received At Least 1 Dose of RV5 or RV1 Versus Unvaccinated Age-eligible Children*

	Normal Birth Weight			Low Birth Weight			Very Low Birth Weight		
	Vax+	Vax−		Vax+	Vax−		Vax+	Vax−	
Season	Rate/10,000 PY		Rate Reduction (95% CI)	Rate/10,000 PY		Rate Reduction (95% CI)	Rate/10,000 PY		Rate Reduction (95% CI)
Acute gastroenteritis hospitalizations									
2008–2009	43	81	49 (42–55)	66	164	60 (36–75)	40	141	75 (17–93)
2009–2010	25	46	47 (36–56)	56	138	62 (35–78)	39	203	80 (37–93)
2010–2011	27	56	52 (43–59)	46	170	72 (53–83)	71	76	15 (−140 to 70)
2011–2012	23	35	32 (17–44)	31	144	80 (65–88)	47	212	82 (57–93)
2012–2013	24	59	59 (51–65)	55	147	66 (43–80)	70	244	71 (35–87)
2013–2014	20	31	34 (14–50)	43	128	66 (38–81)	78	209	61 (14–82)
2014–2015	23	62	62 (51–71)	40	144	72 (44–86)	54	166	71 (7–91)

- La reducción de ingresos es similar (very low vs. normal).
- Se mantiene durante todo el periodo.
- Aproximadamente por cada 100 VLW vacunados evitaríamos 1 ingreso

The Pediatric Infectious Disease Journal Volume 37, Number 8, August 2018. Effect of Rotavirus Vaccination on Acute Diarrheal Hospitalizations Among Low and Very Low Birth Weight US Infants, 2001–2015

Resumen

- Carga de enfermedad
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- Grupos de riesgo en prematuros
- Costo-efectividad

Costo-efectividad

280.338/AVAC perspectiva pagador

210.167/AVAC perspectiva social

Con un precio por dosis 22 euros (66 pauta): 40.140 euros/AVAC

Agencia de Evaluación de Tecnologías Sanitarias (AETS)
Instituto de Salud Carlos III - Ministerio de Ciencia e Investigación
IMAZ IGLESIA I, CORNEJO GUTIÉRREZ A M.ª, RUBIO GONZÁLEZ B, GONZÁLEZ ENRÍQUEZ J,
"Análisis Coste-Utilidad de la Introducción de la Vacunación Universal frente al Rotavirus en España"
Madrid: AETS - Instituto de Salud Carlos III, Madrid. Diciembre de 2011

Mayor costo-efectividad en grupos de riesgo

Mean costs per different health outcome comparing different RV vaccination strategies under base-case assumptions (RV1) using a healthcare provider perspective			
Cost (Euros)	Targeted vs. no vaccination	Universal vs. no vaccination	Universal vs. targeted vaccination
Por caso evitado	21	174	191
Por año de vida salvado	2400	96.600	894.000
Por QALY	2600	60.200	162.000

Los autores proponen estrategias en grupos de riesgo como una estrategia más costo-efectiva y sostenible en aquellos países donde RV no supone una carga importante de enfermedad grave.

El pequeño número de muertes observados se da en estos pacientes

Bruijning-Verhagen et al. BMC Medicine 2013, 11:112 Targeted rotavirus vaccination of high-risk infants; a low cost and highly cost-effective alternative to universal vaccination

Pero el costo-efectividad es muy variable…

On the basis of the study, the committee concluded that the findings of the new study supported its original statement that Rotavirus vaccines would reduce the incidence of gastroenteritis in the population. However, at the vaccine prices considered (£35 per dose for Rotarix® and £25 per dose for RotaTeq®) they do not meet the current economic criteria for the introduction of a new vaccine. Introduction of rotavirus vaccines would only become cost-effective if the vaccine prices are much less than those at which they are currently being offered.

Minutes JCVI 8 junio 2011

RU introdujo la vacunación universal en 2013

Resumen

- Carga de enfermedad
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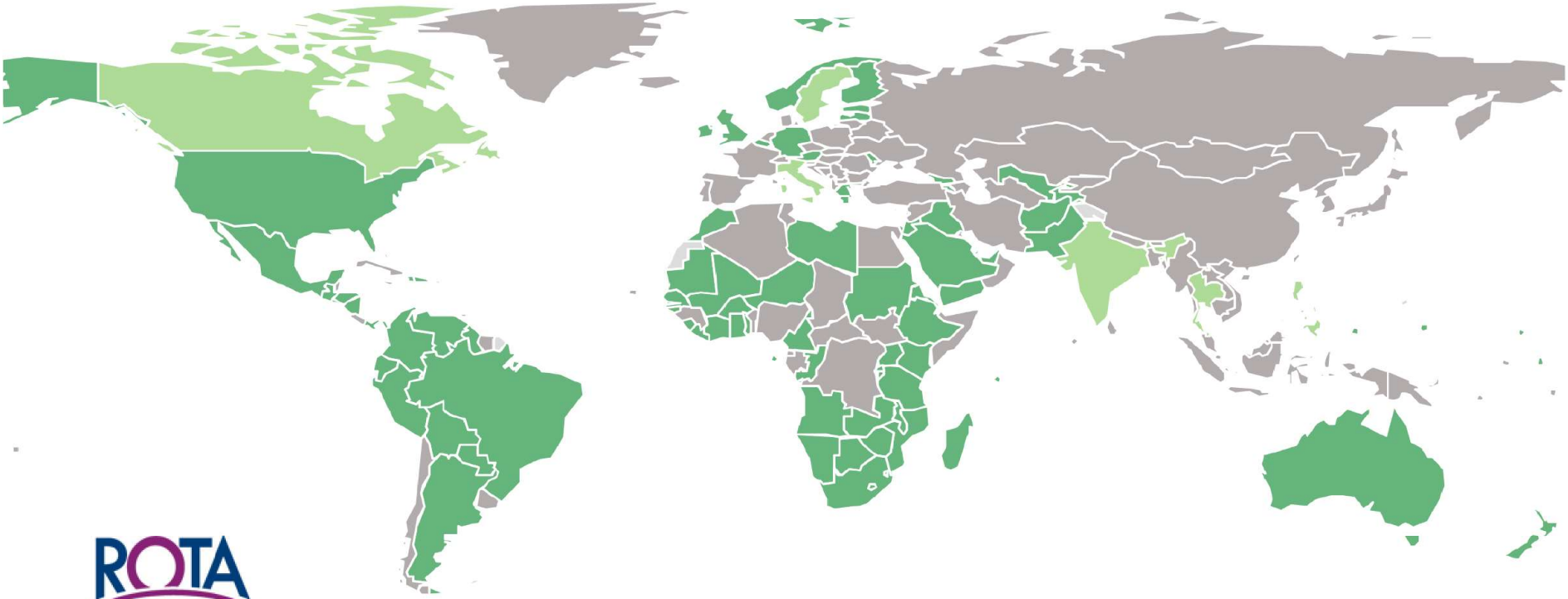
- Futuro vacunación frente a RV



ROTA COUNCIL
Rotavirus Organization of Technical Allies

VIEW-hub

Conclusiones

La carga de enfermedad por RV es importante

La gravedad aumenta en prematuros y bajo peso

La vacuna es efectiva y segura (también en prematuros)

Los estudios de CE más favorables en prematuros y bajo peso

Las estrategias dirigidas a prematuros cumplen más criterios de introducción de vacuna en calendario

Muchas gracias

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