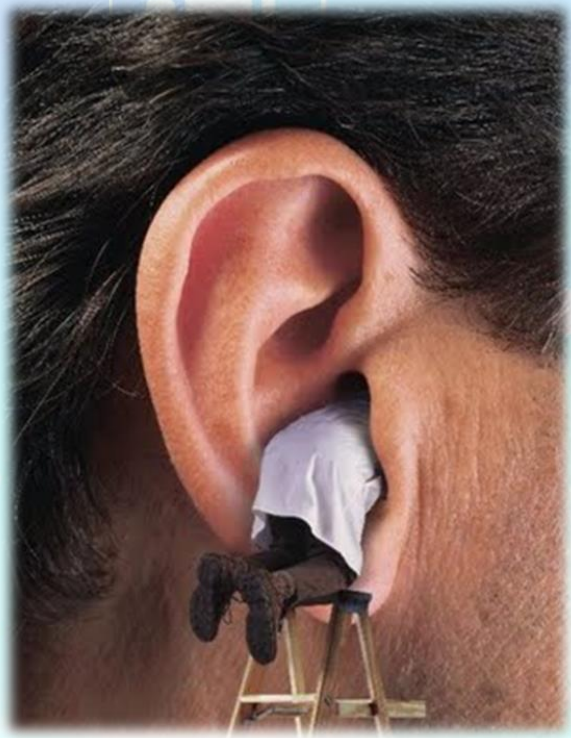


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Congresso Nacional de Pediatria, para
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IMPACTO DA VACINAÇÃO PNEUMOCÓCICA NA OTITE MÉDIA AGUDA

Francisco Bianchi Aguiar

Nuno Trigueiros

OTITE MÉDIA

NA CRIANÇA É A CAUSA MAIS FREQUENTE DE:

- Consultas urgentes
- Prescrição de antibióticos
- Cirurgia

OTITE MÉDIA

NA CRIANÇA

- 1º ano 40% teve pelo menos 1 OMA
- Até aos 3 anos 85% 1 ou mais OMA
- Pico de incidência entre os 6 e 12 meses
- Custo estimado de 2,8 bilhões de Dólares (EUA, 2006)

OTITE MÉDIA

Fatores de risco

- episódio prévio de OMA (< 6M vida)
- presença de OME crônica
- infantilário
- sexo masculino
- idade < 3A
- uso de chupeta
- Ø amamentação
- anomalias craniofaciais (fenda palatina, sdr Down)
- fumo passivo
- atopia
- imunodeficiência

OTITE MÉDIA

SEQUELAS

- Hipoacusia
- Atraso da linguagem
- Absentismo escolar e laboral (dos pais)
- Complicações não negligenciáveis
 - Extracranianas
 - Intracranianas

AGENTES ETIOLÓGICOS OMA

1. *Streptococcus pneumoniae*
2. *Haemophilus influenzae* não tipável
3. *Moraxella catarrhalis*
4. *Streptococcus pyogenes*

Pneumococos

- ❑ Coloniza a nasofaringe e em menor grau a orofaringe
- ❑ A colonização antecede as infecções respiratórias
 - Doenças da mucosa (otites e sinusites)
 - Doenças invasivas
- ❑ A vacina evita a colonização da mucosa
 - “estado portador”

Doença Pneumocócica



Vacinas Pneumocócicas

Vacina polissacárida

- Polissacáridos capsulares purificados
- Baixa capacidade imunogénica

Vacina conjugada

- Conjugada com proteína
- Aumenta capacidade imunogénica

Vacinas Pneumocócicas

Vacina Polissacárida

- Sem resposta em menores de 2 anos
- Não reduz estado portador
- Induz resposta independente de células T
- Sem memória imunológica T dependente
- Recomendada para grupos de risco

Vacinas Pneumocócicas

Vacina conjugada

- ❑ Polissacáridos conjugados com:
 - Mutante não tóxico da toxina diftérica e com proteína CRM197
 - Proteína D do *Haemophilus influenzae*
- ❑ Immunogénica desde as 6 semanas de vida
- ❑ Diminuição estado portador – imunidade da mucosa
- ❑ Imunidade duradoura

Vacinas anti-pneumocócica

2001 – introdução vacina PN7

2009 – introdução vacina PN10

2010 – introdução vacina PN13

2015 – incluído PNV

32%

79,1%

75%

62%

58%

2002

2007

2008

2009

2010

PNV 2017 – ESQUEMA RECOMENDADO

	Nasc	2 meses	4 meses	6 meses	12 meses	18 meses	5 anos	10 anos	25 anos	45 anos	65 anos	10/10 anos
Hebatite B	VHB 1	VHB 2		VHB 3								
Infeções por Haemophilus influenzae b		Hib 1	Hib 2	Hib 3		Hib 4						
Difteria, tétano, tosse convulsa*		DTPa 1	DTPa 2	DTPa 3		DTPa 4	DTPa 5	Td 1	Td 2	Td 3	Td 4	Td 5 ...
Poliomielite		VIP 1	VIP 2	VIP 3		VIP 4	VIP 5					
Infeções por Streptococcus pneumoniae		Pn13 1	Pn13 2		Pn13 3							
Infeções por Neisseria meningitidis C					MenC 1							
Sarampo, Parotidite epidémica, Rubéola					VASPR 1		VASPR 2					
Infeções por vírus do Papiloma humano **								HPV 1,2				

* As grávidas serão vacinadas contra a tosse convulsa, o tétano e a difteria (Tdpa) em cada gravidez

** Aplicável apenas a raparigas, com o esquema 0, 6 meses

Impacto da vacina PN13

- **Marcada redução da doença invasiva pelo pneumococos**
- **Otite média aguda?**
 - Difícil de avaliar
 - Nem todos os episódios são causados pelo pneumococos
 - Timpanocentese não é uma prática de rotina
 - Resultados imprecisos

Impacto da vacina PN13

- **Redução na incidência da OMA**
- **Redução de formas graves**
- **“fenómeno de substituição”**
 - Substituição por outros serotipos do pneumococos
 - Substituição por outras bactérias
 - *Haemophilus influenzae* não tipável
 - *Moraxella catarrhalis*

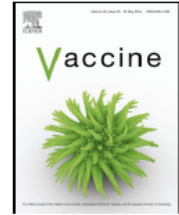
Impacto da vacina PN13



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Vaccine

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Impact of pneumococcal conjugate vaccines on childhood otitis media in the United Kingdom

Wallis C.Y. Lau^a, Macey Murray^b, Aisha El-Turki^{b,c}, Sonia Saxena^d, Shamez Ladhani^{e,g}, Paul Long^f, Mike Sharland^g, Ian C.K. Wong^{a,b}, Yingfen Hsia^{g,*}

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Impacto da vacina PN13

A B S T R A C T

Background: Studies have demonstrated a reduction for otitis media (OM) following the introduction of seven-valent pneumococcal conjugate vaccine (PCV7), but this has not been evaluated in the United Kingdom (UK). Moreover, there are limited data on any additional impact of PCV13 introduction in 2010.

Methods: We conducted an observational cohort study to investigate the trends in OM incidence and associated antibiotic prescriptions in children aged <10 year-olds during 2002–2012 using a national primary care database. Three time-periods were defined to estimate monthly incidence: pre-PCV7 (January 2002–August 2006), post-PCV7 (September 2007–March 2010), and post-PCV13 (April 2011–December 2012).

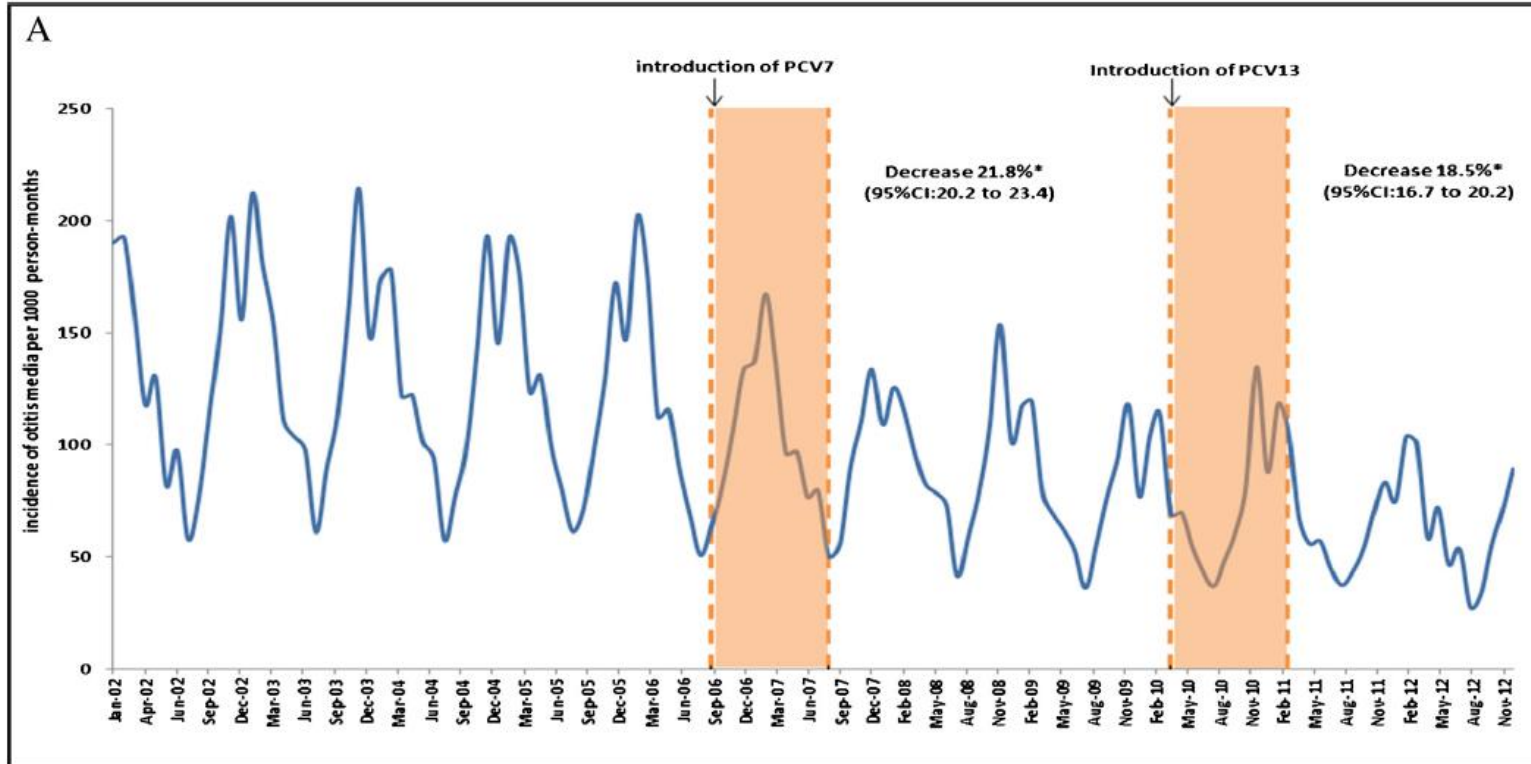
Results: Overall annual OM incidence declined by 51.3% from 135.8 episodes/1000 person-years in 2002 to 66.1 episodes/1000 person-years in 2012; antibiotic prescription rates for OM declined by 72.9% from 57.9 prescriptions/1000 person-years to 15.7 prescriptions/1000 person-years, respectively. PCV7 introduction was associated with significant decline in OM rates across all age-groups (21.8%; 95% CI, 20.2–23.4), including <2 year-olds (19.8%; 95% CI, 16.0–23.5%); 2–4 year-olds (23.0%; 95% CI, 20.4–25.4%) and 5–9 year-olds (20.2%; 95% CI, 17.6–22.7%). There was an additional significant reduction in OM (18.5%; 95% CI, 16.7–20.2%) and associated antibiotic prescribing (12.2%; 95% CI, 8.6–15.6%) after the introduction of PCV13 across all age-groups.

Conclusion: The introduction of PCV7 was associated with a 22% significant reductions in OM in children aged <10 year-olds with an additional 19% reductions after PCV13 introduction. These declines are equivalent to 592,000 and 15,700 fewer consultations and OM-related hospitalizations, respectively, in England and Wales every year. Although the continuing decline in OM rates in our study suggests that further reduction may continue to occur, it is important to monitor long-term trends in all pneumococcal diseases, including OM and pneumonia, because of increasing replacement of non-vaccine pneumococcal serotypes in carriage and disease.

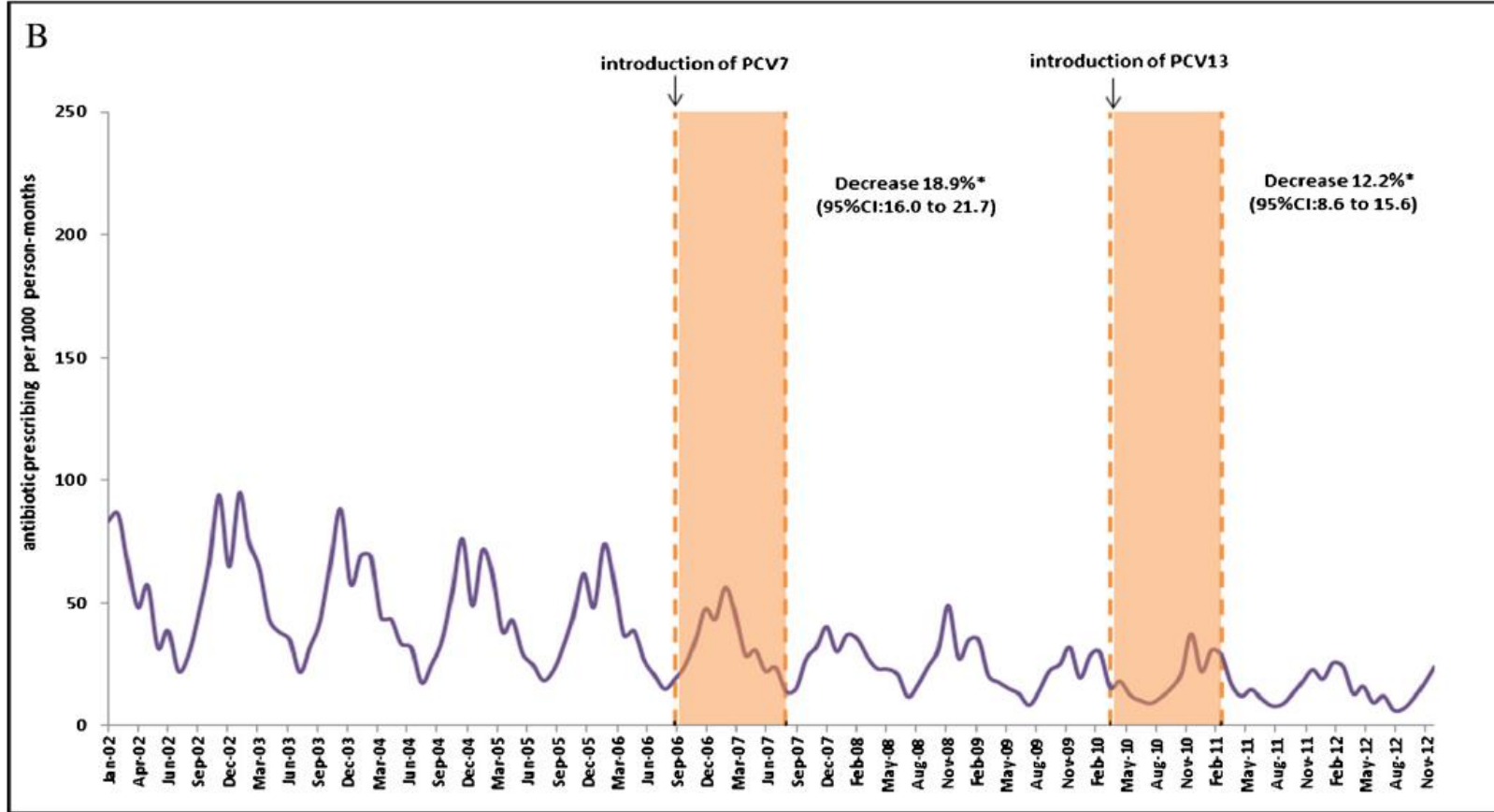
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W.C.Y. Lau et al. / Vaccine xxx (2015) xxx–xxx



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Impacto da vacina PN13

8. Conclusion

The introduction of PCV7 was associated with a significant reduction in primary care consultations for OM and antibiotic prescribing rates, with a similar additional decline within two years of PCV7 replacement with PCV13. These reductions were observed not only in vaccine-eligible children but also among older children because of indirect protection and it is likely that older age groups not included in our study will also have benefitted from this indirect protection. Although the continuing decline in OM rates during 2012 suggests that further reductions may continue to occur, it will be important to monitor long-term trends in all clinical manifestations of pneumococcal disease, including OM and pneumonia, because of increasing replacement of non-vaccine pneumococcal serotypes in carriage and disease [5,42].

Impacto da vacina PN13

- Redução na incidência da OMA
- Redução de formas graves
- “fenómeno de substituição”
 - Substituição por outros serotipos do pneumococos
 - Substituição por outras bactérias
 - *Haemophilus influenza* não tipável
 - *Moraxella catharralis*

Impacto da vacina PN13



Prevention of early episodes of otitis media by pneumococcal vaccines might reduce progression to complex disease

Ron Dagan, Stephen Pelton, Lauren Bakaletz, Robert Cohen

Lancet Infect Dis 2016;
16: 480-92

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Otitis media is a common childhood infection of the middle ear and a major cause of morbidity. This multifactorial disease manifests as a spectrum of clinical syndromes from uncomplicated acute otitis media to more complex recurrent and chronic cases (frequently polymicrobial), with the major pathogens involved being *Streptococcus pneumoniae* and non-typeable *Haemophilus influenzae*. Pneumococcal conjugate vaccines (PCVs) target only a few serotypes that cause otitis media; however, results from studies suggest that existing PCVs can prevent early episodes of disease associated with vaccine serotypes, resulting in a reduction of subsequent complex cases caused by non-vaccine serotypes and other otopathogens, which contribute considerably to the disease burden. In this Review, we discuss the role of pneumococcus in the disease continuum and assess clinical evidence showing the effect of prevention of early episodes on the complex interplay between bacterial species implicated in otitis media.

Impacto da vacina PN13

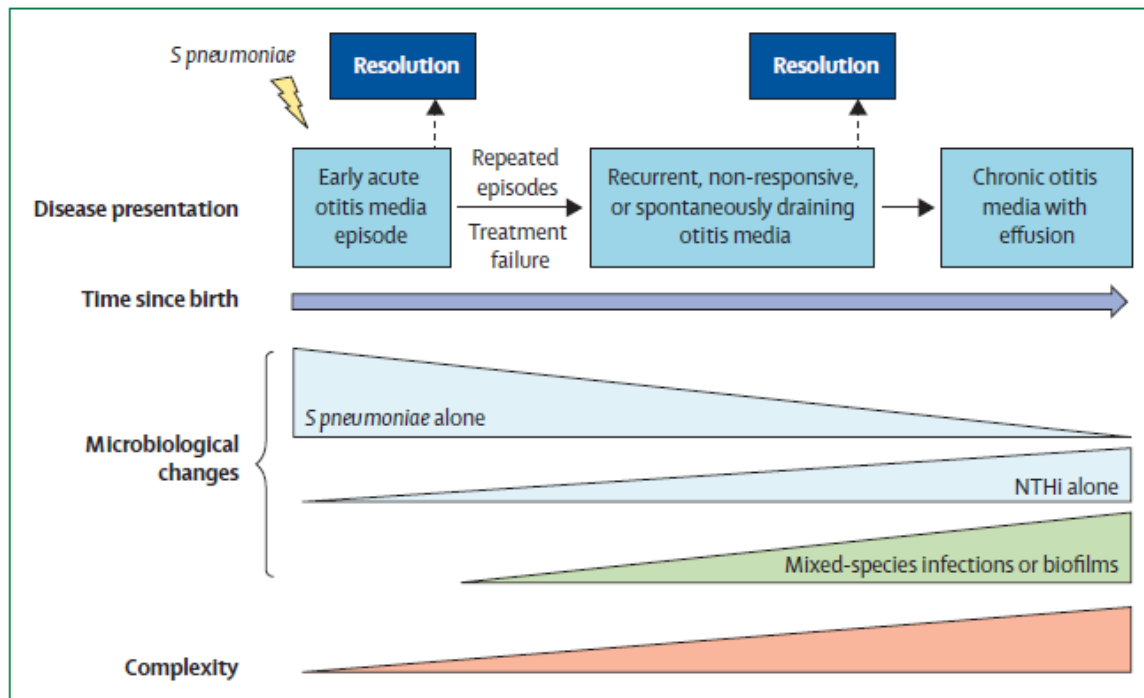


Figure 1: Involvement of *Streptococcus pneumoniae* and NTHi in otitis media evolution—the disease continuum model of pathogenesis

Complex otitis media is defined as any cases of recurrent, non-responsive, and spontaneously draining infections, and chronic disease with effusion (which is a long-term and recurrent infection and inflammation of the middle ear). NTHi=non-typeable *Haemophilus influenzae*.

Impacto da vacina PN13

PCVs resulted in important changes in the microbiology of otitis media.^{32–36} Increases in both the proportions and the absolute incidence of infections caused by non-vaccine-type *S pneumoniae* were reported after reductions in disease caused by vaccine-type strains (ie, serotype replacement).^{37–42} Furthermore, in most studies, the proportion of otitis media cases caused by NTHi increased,^{3,32,43–47} suggesting that NTHi has become the predominant causative agent worldwide. However, the overall reductions in disease burden and the incidence of complex cases after widespread vaccination with PCVs suggest that the replacement was far from complete. Antibiotic use might also select for specific pneumococcal serotypes or NTHi strains.^{6,30,48} Use of PCVs resulted in reduced antibiotic treatment,^{7,22,49} potentially diminishing this effect. However, antibiotic use and its effects are also beyond the scope of this Review.



Impacto da vacina PN13

Conclusion

S pneumoniae and NTHi are responsible for most cases of otitis media worldwide, although their contribution to the disease continuum varies. *S pneumoniae* is more frequently responsible for early episodes of otitis media and potentially initiates middle-ear damage, leading to a disease cascade that results in subsequent polymicrobial infections, which are generally associated with NTHi and biofilms (figure 6A). The ability of these associated otopathogens to form biofilms is key to the pathogenesis of complex otitis media.

Reduction of early episodes with PCVs can alter the pathogenic progression of otitis media, decreasing complex sequelae that are often associated with pathogens other than vaccine-type *S pneumoniae*, particularly NTHi (figure 6B). Once initial damage occurs and recurrent otitis media is established, PCVs cannot further reduce disease beyond that caused by vaccine-type infections (figure 6C), thereby strengthening the need for continued development of vaccines targeting the predominant pathogens of chronic and recurrent otitis media—namely, NTHi.

Impacto da vacina PN13

- **Redução na incidência da OMA**
- **Mais significativa redução de formas graves**
- **“fenómeno de substituição”**
 - Substituição por outros serotipos do pneumococos
 - Substituição por outras bactérias
 - *Haemophilus influenza* não tipável
 - *Moraxella catharralis*

Impacto da vacina PN13

Pneumococcal carriage and serotype variation before and after introduction of pneumococcal conjugate vaccines in patients with acute otitis media in Switzerland

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ABSTRACT

Background: Acute otitis media (AOM) is an important cause for antibiotic prescription within the paediatric population and *Streptococcus pneumoniae* is a major pathogen associated with AOM episodes. This study aimed at analysing the influence of the heptavalent and 13-valent pneumococcal conjugate vaccines (PCV7 and PCV13) on pneumococcal carriage and serotype distribution in AOM.

Methods: Nasopharyngeal swabs (NPS) and middle ear fluid (MEF) were collected within a Swiss surveillance study of outpatients from all ages with AOM between 2004 and 2015, covering three vaccination eras (pre-PCV7, PCV7 and PCV13). Samples were cultured for pneumococcal identification, and the association of vaccine era with pneumococcal carriage was investigated by logistic regression analysis adjusting for sociodemographic factors.

Findings: In total, 3300 NPS and 620 MEF were included in this study. The number of samples from patients with AOM dropped over vaccination eras and *S. pneumoniae* was less frequently isolated in the PCV13 era as compared to the other two eras. The latest (PCV13) vaccination era was independently associated with a reduced pneumococcal carriage within NPS (adjusted odds ratio 0.65, 95%-CI 0.45–0.94). Investigating serotype epidemiology, vaccine serotypes decreased significantly after the conjugate vaccine introductions with the exception of serotype 3. Within the non-PCV13 serotypes, a particular increase of serogroups 11, 15 and 23 was observed in both NPS and MEF.

Conclusion: A substantial change in pneumococcal carriage and serotype epidemiology suggests an impact of the conjugate vaccines on pneumococcal AOM in Switzerland.

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Vaccine

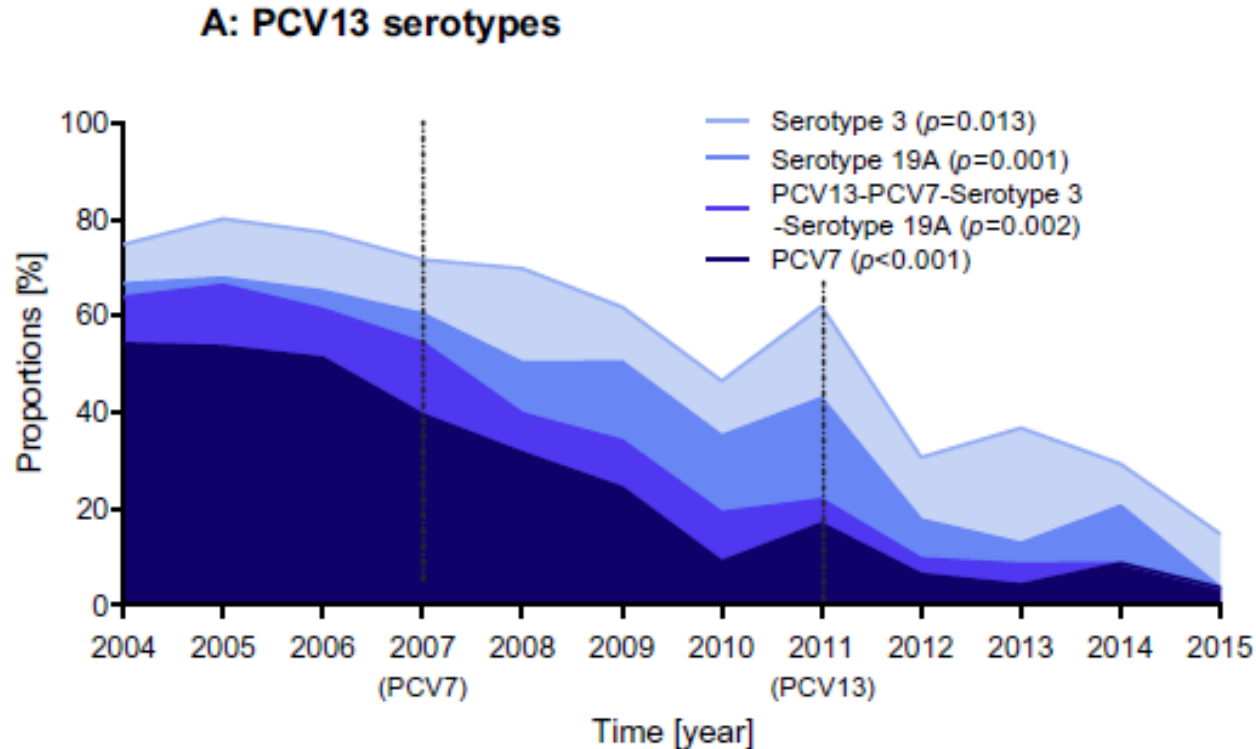


The Official Journal of the Edward Jenner Society and the Japanese Society for Vaccinology

Impacto da vacina PN13

Pneumococcal carriage and serotype variation before and after introduction of pneumococcal conjugate vaccines in patients with acute otitis media in Switzerland

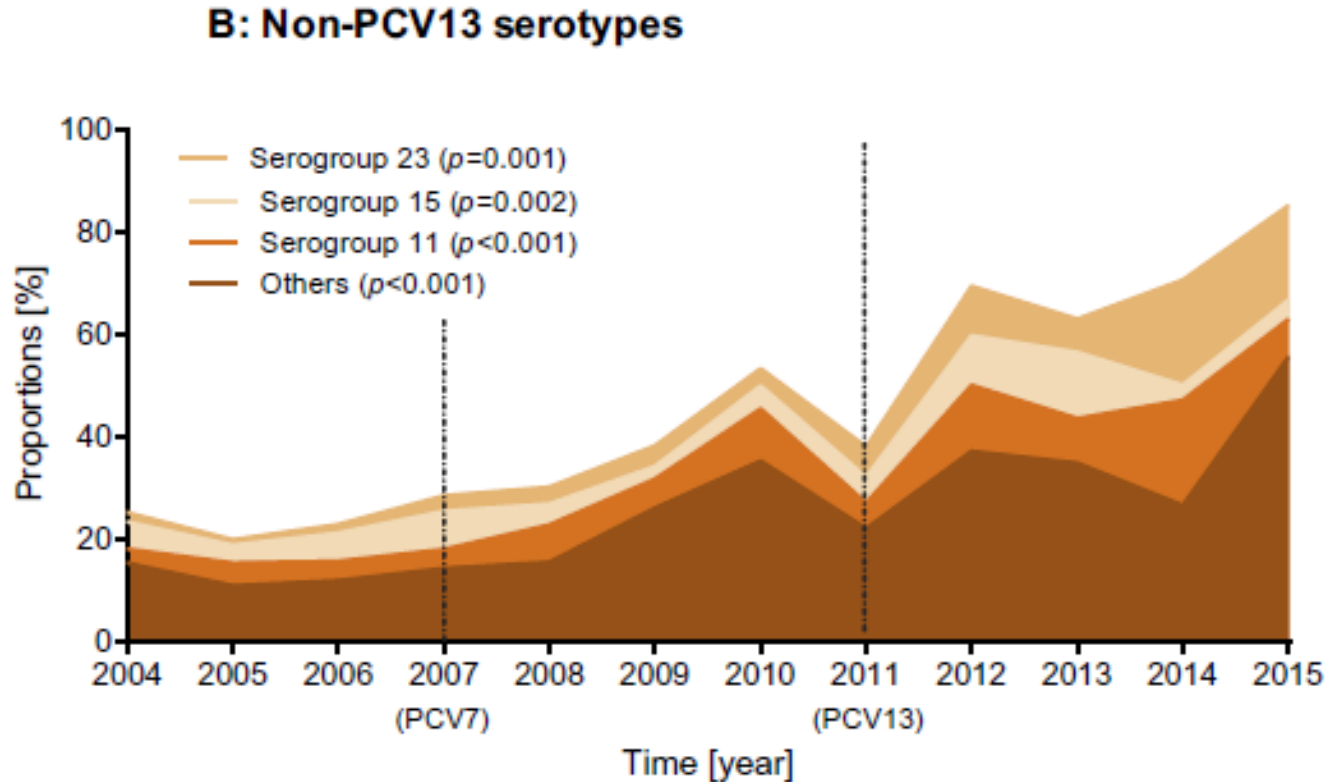
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Impacto da vacina PN13

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Impacto da vacina PN13

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Impacto da vacina PN13

Epidemiology of Acute Otitis Media in the Postpneumococcal Conjugate Vaccine Era

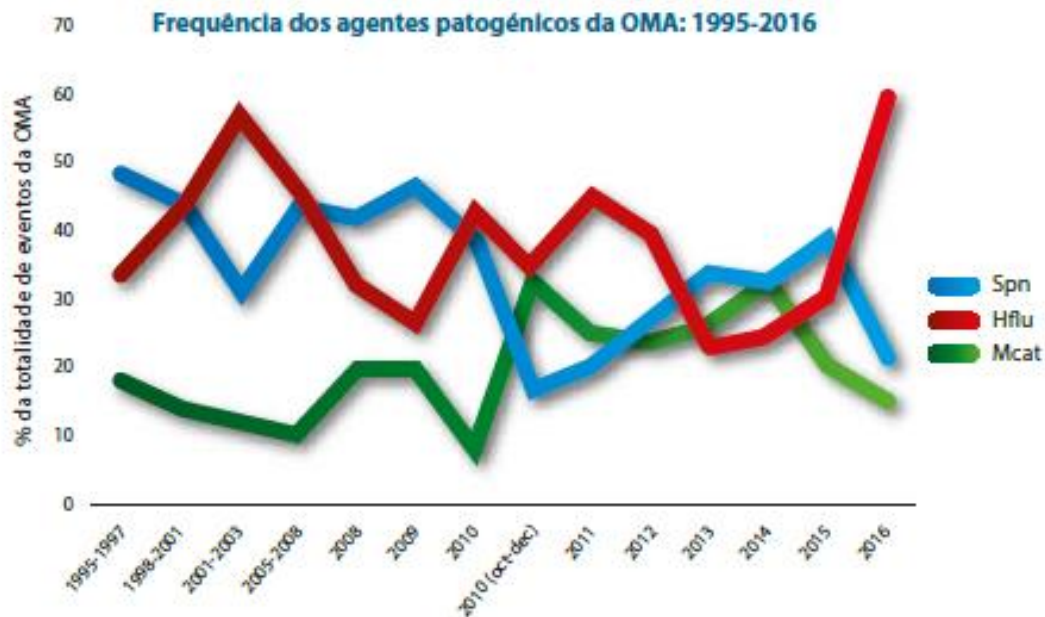
OBJECTIVES: To study the epidemiology of acute otitis media (AOM), especially the otitis-prone condition, during the pneumococcal conjugate vaccines 7 and 13 era.

METHODS: Six hundred and fifteen children were prospectively managed from 6 to 36 months of life during a 10-year time frame (June 2006–June 2016). All clinical diagnoses of AOM were confirmed by tympanocentesis and bacterial culture of middle ear fluid.

CONCLUSIONS: We conclude that the epidemiology but not the risk factors for AOM have undergone substantial changes since the introduction of pneumococcal conjugate vaccines.

To cite: Kaur R, Morris M, Pichichero ME. Epidemiology of Acute Otitis Media in the Postpneumococcal Conjugate Vaccine Era. *Pediatrics*. 2017;140(3):e20170181

Impacto da vacina PN13



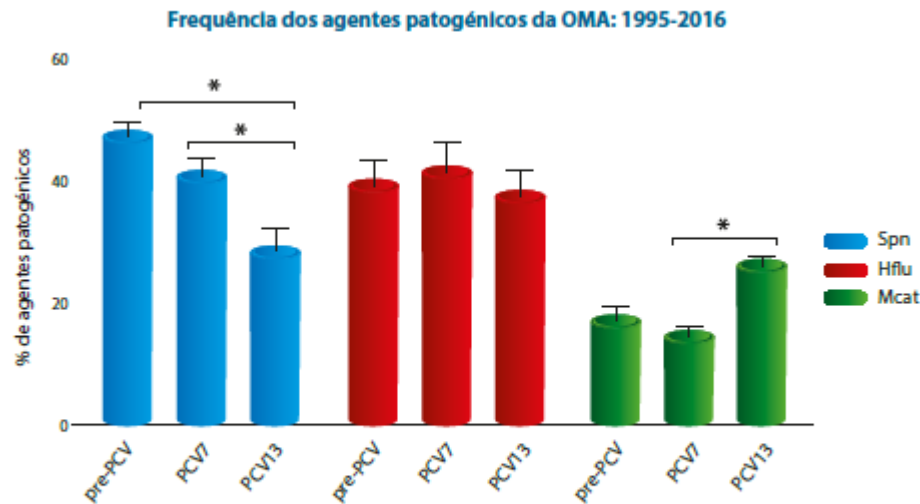
(A) Frequência de otopatógenos isolados no líquido do ouvido médio durante OMA de 1995 a 2016. Spn, *S. pneumoniae*; Hflu, *H. influenzae*; and Mcat, *M. catarrhalis*.¹

To cite: Kaur R, Morris M, Pichichero ME. Epidemiology of Acute Otitis Media in the Postpneumococcal Conjugate Vaccine Era. *Pediatrics*. 2017;140(3):e20170181

Impacto da vacina PN13

Evolução dos otopatógenos nas eras vacinais:

- Diminuição significativa de *S. pneumoniae*;
- Aumento da prevalência de *M. catarrhalis*;
- *H. influenzae* manteve-se importante;
- *H. influenzae* e *Moraxella catarrhalis* são produtoras de β -lactamases



(B) Alterações na prevalência dos otopatógenos nas diferentes eras vacinais - pre-PCV: 1995-2001; PCV7: 2001-2010; PCV13: 2010-2016). (* P < 0,05). Spn, *S. pneumoniae*; Hflu, *H. influenzae*; e Mcat, *M. catarrhalis*.

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Impacto da vacina PN13

CONCLUSIONS

The epidemiology of AOM has undergone shifts over the past 30 years, especially since the introduction of PCVs. Because the risk factors for AOM we identify in this study are predominantly similar to those described by Teele et al,¹ we conclude that much of the shift in otopathogen prevalence can be attributed to the influence of the vaccine and changes in diagnostic criteria for AOM versus otitis media with effusion. In comparison with 30 years ago, (1) the number of AOM episodes and the number of otitis-prone children have decreased, and major contributors to this

decrease are the introduction of PCV formulations and more stringent diagnostic criteria; (2) AOM early in life remains a predictor of otitis-prone condition; (3) day care attendance and family history of AOM are predominant risk factors in both AOM and becoming otitis prone; and (4) the otopathogens mix has undergone multiple dynamic changes that likely will continue in the years ahead.

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We thank Dr Janet Casey, the nurses and staff of Legacy Pediatrics, the parents who consented, and the

Impacto da vacina PN13



Changing Trends of Acute Otitis Media Bacteriology in Central Israel in the Pneumococcal Conjugate Vaccines Era

Tamir Sharon Ovnat MD; Roth, Yehudah MD; Dalal, Ilan MD; Goldfarb, Abraham MD; Grotto, Itamar MD, MPH, PhD; Marom, Tal MD

The Pediatric Infectious Disease Journal . : p 195–199, February 2015.

doi: 10.1097/INF.0000000000000536

Author Information

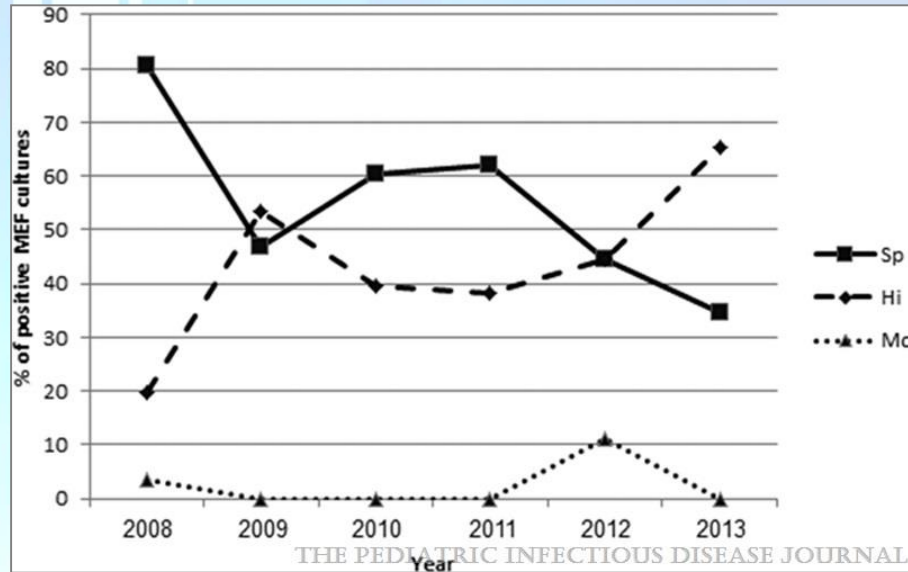
From the *Department of Otolaryngology-Head and Neck Surgery, †Pediatric Allergy/Immunology Unit, Edith Wolfson Medical Center, Tel Aviv University Sackler School of Medicine, Holon, Israel; ‡Public Health Services, Israel Ministry of Health, Jerusalem, Israel; and §Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer Sheva, Israel.

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The authors have no conflicts of interest to disclose.

Supplemental digital content is available for this article. Direct

Impacto da vacina PN13



Changing Trends of Acute Otitis Media Bacteriology in Central Israel in the Pneumococcal Conjugate Vaccines Era

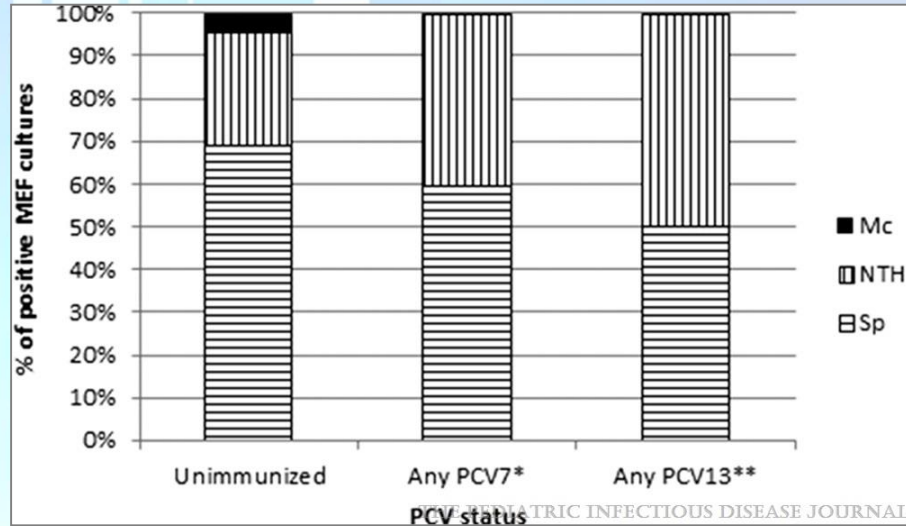
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The Pediatric Infectious Disease Journal 34(2):195-199, February 2015.

doi: 10.1097/INF.0000000000000536

Rates of positive middle ear fluid cultures, by otopathogen, by study year. Rates are shown as the percentage of each positive MEF culture per each otopathogen from the total yearly positive MEF cultures. 2009, formal year of PCV7 introduction; 2010, PCV13 introduction year. MEF, middle ear fluid, Sp, *Streptococcus pneumoniae*, NTHi, nontypeable *Haemophilus influenzae*; Mc, *Moraxella catarrhalis*.

Impacto da vacina PN13



Changing Trends of Acute Otitis Media Bacteriology in Central Israel in the Pneumococcal Conjugate Vaccines Era

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Otopathogens distribution in "severe" AOM episodes with positive MEF cultures, by PCV status. Asterisk (*) denotes significant reduction of *S. pneumoniae*-positive MEF cultures in PCV7-immunized children (59%), when compared with unimmunized children (69%) ($P = 0.04$). Asterisks (**) denote significant reduction of *S. pneumoniae*-positive MEF culture rate in PCV13-immunized children (50%), when compared with unimmunized children and PCV7-immunized children, $P = 0.02$ and $P = 0.04$, respectively. PCV, pneumococcal conjugate vaccine; MEF, middle ear fluid; Mc, *Moraxella catarrhalis*; NTHi, nontypeable *Haemophilus influenzae*; Sp, *Streptococcus pneumoniae*.

Impacto da vacina PN13

- Redução na incidência da OMA
- Mais significativa redução de formas graves
- “fenómeno de substituição”
 - Substituição por outros serotipos do pneumococos
 - Substituição por outras bactérias
 - *Haemophilus influenzae* não tipável
 - *Moraxella catarrhalis*

Haemophilus influenzae

- **Seis tipos capsulares – A a F**
 - **Serotipo B** – o mais patogénico
 - Responsável por 95% das doenças invasivas
 - **Serotipo F** – o segundo mais importante
- **Serotipos não capsulados / não tipaveis - NTHi**

Vacina anti-*Haemophilus influenzae* tipo B - Hib

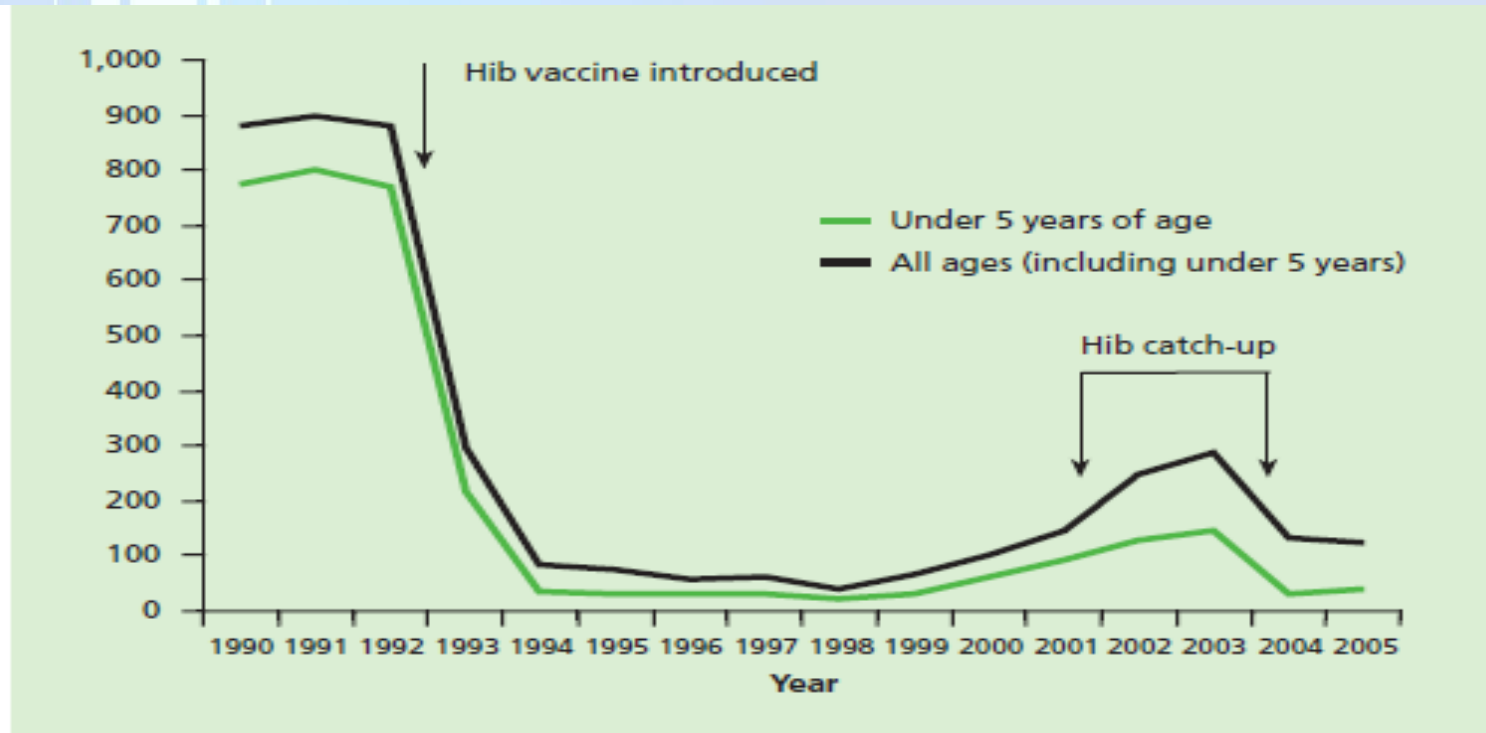


Figure 16.1 Laboratory reports of Hib disease in England and Wales (1990–2005)

Haemophilus influenzae não-tipável

- 23% a 67%
- Importância crescente
- Principal agente na otite recorrente
- 20% a 35% produtores de β -lactamases

Haemophilus influenzae não-tipável na OMA

- **Conjuntivite concomitante**
- **Bilateral**
- **Otite recorrente**
- **Tratamento prévio c/ amoxicilina**
- **Falência terapêutica**

Mecanismos de resistência de *Haemophilus influenzae*

- “**Não produtoras de β -lactamases ampicilina resistentes**” (BLNAR)
 - Não permeabilidade parede celular ao antibiótico
 - Sem afinidade PBP (penicillin-binding protein)
- **Produção β -lactamases**
 - Enzimas que inativam os antibióticos
 - Constitutiva ou indutiva
 - **Mecanismo mais importante de resistência**

Mecanismos de resistência de *Haemophilus influenzae*

The Viriato Study

Update on Antimicrobial Resistance of Microbial Pathogens Responsible for Community-Acquired Respiratory Tract Infections in Portugal

José Melo-Cristino, Letícia Santos, Catarina Silva-Costa, Ana Friães, Marcos D. Pinho and Mário Ramirez, on behalf of the Portuguese Surveillance Group for the Study of Respiratory Pathogens*

Institute of Microbiology, Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Lisbon, Portugal

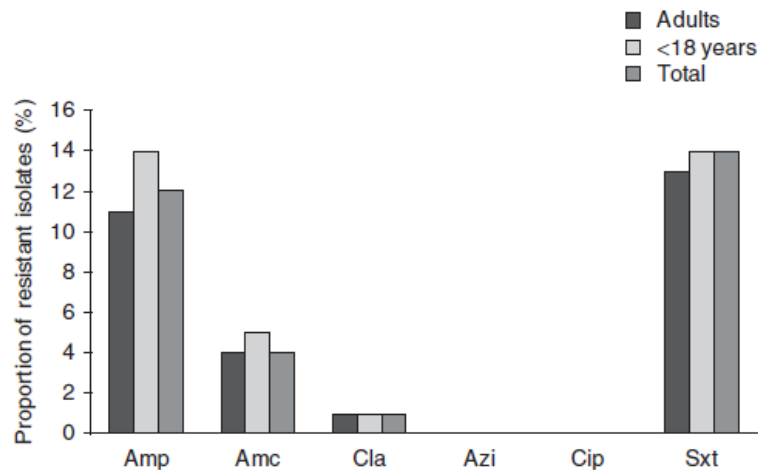


Fig. 4. *H. influenzae* antimicrobial resistance (%) in 2007. **Amc**= Amoxicillin-clavulanate; **Amp**= ampicillin; **Azi**= azithromycin; **Cip**= ciprofloxacin; **Cla**= clarithromycin; **Sxt**= trimethoprim-sulphamethoxazole.

Moraxella catarrhalis

- Diplococos aeróbico gram negativo
- Anterior/ designada Micrococos C., Neisseria C.; Branhamella
- Considerada não-patogénica nos anos 70
- Emergiu como patogénico genuíno nos últimos anos
- Causa frequente de OMA na criança
- Responsável por infecções respiratórias inferiores em idosos

Mecanismos de resistência de *Moraxella catarrhalis*

- Inicialmente susceptível amoxicilina
- **Atualmente resistente – produtoras β -lactamases (> 90%)**
- **Sensível associação – amoxicilina / ácido clavulânico**
- Cefalosporinas
- Sulfametoxazol
- Macrólidos

Mecanismos de resistência de *Moraxella catarrhalis*

ESTUDO VIRIATO: ACTUALIZAÇÃO DE DADOS DE SUSCEPTIBILIDADE AOS ANTIMICROBIANOS
DE BACTÉRIAS RESPONSÁVEIS POR INFECÇÕES RESPIRATÓRIAS ADQUIRIDAS NA COMUNIDADE
EM PORTUGAL EM 2003 E 2004

J. Melo-Cristino, Leticia Santos, Mário Ramirez e Grupo de Estudo Português de Bactérias Patogénicas Respiratórias

Quadro IV – Susceptibilidade aos antimicrobianos de 303 estirpes de *Moraxella catarrhalis* isoladas em 2003 e 2004

	<i>Moraxella catarrhalis</i> (n = 303)		
	Adultos n = 186 (61,4%)	Pediatria n = 117 (38,6%)	Total n = 303
Antimicrobiano	Estirpes	Estirpes	Estirpes
	resistentes	resistentes	resistentes
Ampicilina	179 (96,2 %)	113 (96,6 %)	292 (96,4 %)
Amoxicilina/clavulanato	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)
Cefuroxima	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)
Claritromicina	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)
Azitromicina	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)
Ciprofloxacina	0 (0,0 %)	0 (0,0 %)	0 (0,0 %)
Tetraciclina	2 (1,0 %)	1 (0,9 %)	3 (1,0 %)
Co-trimoxazol	50 (26,9 %)	32 (27,4 %)	82 (27,1 %)

Mecanismos de resistência de *Moraxella catarrhalis*

The Viriato Study

Update on Antimicrobial Resistance of Microbial Pathogens Responsible for Community-Acquired Respiratory Tract Infections in Portugal

José Melo-Cristino, Leticia Santos, Catarina Silva-Costa, Ana Friães, Marcos D. Pinho and Mário Ramirez, on behalf of the Portuguese Surveillance Group for the Study of Respiratory Pathogens*

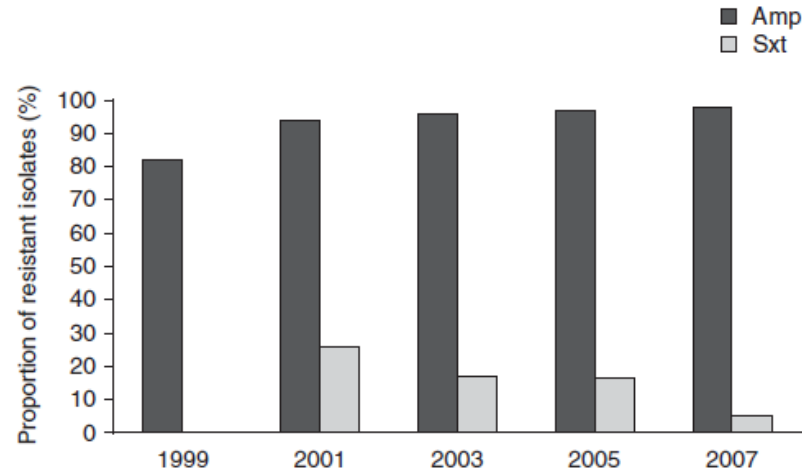


Fig. 7. Evolution of antimicrobial resistance (%) in *M. catarrhalis*. All isolates were susceptible to amoxicillin-clavulanate. **Amp**= ampicillin; **Sxt**= trimethoprim-sulphamethoxazole.

Tratamento da OMA

- ❑ **Sintomático**
- ❑ **Analgesia**
 - Paracetamol
 - Ibuprofeno
- ❑ **Descongestionantes e anti-histamínicos**
 - Sem formal recomendação

Tratamento - Uso de antibióticos

❑ **Aguardar?**

- Iniciar antibióticos se evolução desfavorável 48h/72h

❑ **Medicar com antibióticos de imediato?**

❑ **Depende**

- Idade da criança
- Severidade da doença
- Preferência dos pais

Tratamento - Uso de antibióticos

- **Menos de 6 meses de idade**
- **6 meses – 2 anos**
 - AAP (2013) – situações graves
- **> 2 anos**
 - “Ar tóxico”
 - Otalgia severa > 48 horas
 - Febre > 39 °C

Tratamento — Escolha do antibiótico

- Empírica
- Eficácia clínica e microbiológica
- Aceitação da formulação oral
- Ausência de efeitos secundários e toxicidade
- Conveniência posológica
- Custo

Atenção à alteração
microbiológica

5. Na OMA, a atitude de observação sem tratamento imediato com antibiótico pode ser utilizada em crianças com idade ≥ 6 meses e sem quadro clínico grave (sem otorreia, sem otite recorrente, sem otite bilateral e ≤ 2 A, sem persistência dos sintomas na reavaliação às 48-72h ou sem agravamento dos sintomas) (Nível de Evidência A Grau de Recomendação IIa) ⁽⁴⁻⁹⁾:
6. A prescrição inicial de antibiótico na OMA está indicada:
 - a) Nos lactentes com < 6 meses (Nível de Evidência A, Grau de Recomendação I) ^(3, 10).
 - b) Nas crianças com idade ≥ 6 meses (Nível de Evidência A, Grau de Recomendação IIa) ⁽¹¹⁻¹³⁾:
 - i. OMA com quadro clínico grave;
 - ii. OMA bilateral em criança com idade < 2 anos;
 - iii. Otorreia;
 - iv. OMA recorrente;
 - v. Persistência dos sintomas às 48-72 horas ou agravamento dos mesmos.
7. O antibiótico de primeira linha para tratamento da OMA é a amoxicilina (quadro 2 do anexo I) (Nível de Evidência A, Grau de Recomendação I) ⁽¹⁴⁾.



Quadro 2. Antibióticos utilizados no tratamento da OMA

	Antibiótico	Via	Dose	Nº tomas	Duração
1ª linha	Amoxicilina	oral	80-90 mg/kg/dia (máx 3 g/dia)	12/12h	7 dias se: - Idade < 2 anos - OMA recorrente - Falência do tratamento inicial
2ª linha	Amoxicilina + ác. clavulânico* (formulação 14:1)	oral/i.v.	80-90 mg/kg/dia (de amoxicilina) (máx 3 g/dia)	12/12h	
	Cefuroxima	oral	30 mg/kg/dia (máx 1 g/dia)	12/12h	
		i.v.	80-100 mg/kg/dia (máx 6 g/dia)	8/8h	
	Ceftriaxona**	i.v./i.m.	50 mg/kg/dia (máx 4 g/dia)	24/24h	
Alergia à penicilina tipo 1	Claritromicina	oral	15 mg/kg/dia (máx 1 g/dia)	12/12h	5 dias se: Idade ≥ 2 anos
	Eritromicina	oral	50 mg/kg/dia (máx 2 g/dia)	6/6h ou 8/8h	
	Azitromicina***	oral	10 mg/kg/dia (máx 500 mg/dia)	24/24h	
Alergia à penicilina não tipo 1	Cefuroxima	oral	30 mg/kg/dia (máx 1 g/dia)	12/12h	
		i.v.	80-100 mg/kg/dia (máx 6 g/dia)	8/8h	

* Usar como 1ª linha se tratamento nos 30 dias prévios com amoxicilina ou se suspeita de infeção por *S. aureus*. Nesta última situação preferir as outras formulações de amoxicilina + ácido clavulânico.

** Tratamento durante 1 ou 3 dias. Recomendada duração de 3 dias se administrado por falência do tratamento antibiótico inicial.

*** Tratamento durante 3 dias.



CLINICAL PRACTICE GUIDELINE

The Diagnosis and Management of Acute Otitis Media

abstract

This evidence-based clinical practice guideline is a revision of the 2004 acute otitis media (AOM) guideline from the American Academy of Pediatrics (AAP) and American Academy of Family Physicians. It provides recommendations to primary care clinicians for the management of children from 6 months through 12 years of age with uncomplicated AOM.

FREE

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KEY WORDS

acute otitis media, otitis media, otoscopy, otitis media with effusion, watchful waiting, antibiotics, antibiotic prophylaxis

TABLE 5 Recommended Antibiotics for (Initial or Delayed) Treatment and for Patients Who Have Failed Initial Antibiotic Treatment

Initial Immediate or Delayed Antibiotic Treatment		Antibiotic Treatment After 48–72 h of Failure of Initial Antibiotic Treatment	
Recommended First-line Treatment	Alternative Treatment (if Penicillin Allergy)	Recommended First-line Treatment	Alternative Treatment
Amoxicillin (80–90 mg/kg per day in 2 divided doses)	Cefdinir (14 mg/kg per day in 1 or 2 doses)	Amoxicillin-clavulanate ^a (90 mg/kg per day of amoxicillin, with 6.4 mg/kg per day of clavulanate in 2 divided doses)	Ceftriaxone, 3 d Clindamycin (30–40 mg/kg per day in 3 divided doses), with or without third-generation cephalosporin
or	Cefuroxime (30 mg/kg per day in 2 divided doses)	or	Failure of second antibiotic
Amoxicillin-clavulanate ^a (90 mg/kg per day of amoxicillin, with 6.4 mg/kg per day of clavulanate [amoxicillin to clavulanate ratio, 14:1] in 2 divided doses)	Cefpodoxime (10 mg/kg per day in 2 divided doses)	Ceftriaxone (50 mg IM or IV for 3 d)	Clindamycin (30–40 mg/kg per day in 3 divided doses) plus third-generation cephalosporin
	Ceftriaxone (50 mg IM or IV per day for 1 or 3 d)		Tympanocentesis ^b Consult specialist ^b

IM, intramuscular; IV, intravenous.

^a May be considered in patients who have received amoxicillin in the previous 30 d or who have the otitis-conjunctivitis syndrome.

^b Perform tympanocentesis/drainage if skilled in the procedure, or seek a consultation from an otolaryngologist for tympanocentesis/drainage. If the tympanocentesis reveals multidrug-resistant bacteria, seek an infectious disease specialist consultation.

^c Cefdinir, cefuroxime, cefpodoxime, and ceftriaxone are highly unlikely to be associated with cross-reactivity with penicillin allergy on the basis of their distinct chemical structures. See text for more information.

Tratamento – Falência terapêutica

- ❑ **Ausência de evolução favorável em 48h – 72 horas**
 - Doença concomitante
 - Resistência ao antibiótico
 - Amoxicilina não é eficaz contra espécies produtoras de beta-lactamases
- ❑ **Ponderar alterar o antibiótico**
 - ❑ **Se amoxicilina**
 - associação c/ ácido clavulânico – 90 mg/6,4 mg/kg/dia
 - ❑ **Amoxicilina + ácido clavulânico**
 - Cefuroxima-axetil – 30mg/kg/dia q12h – 10 dias
 - Ceftriaxone – 50mg/dia IM/IV – 3 dias
 - Levofloxacina – 10mg/kg/dia q12h – 10 dias – após 5 anos q24h
 - ❑ **TMP-SMX e macrólidos não são alternativa**

Amoxicilina-ácido clavulânico (14:1)

Amoxicilina/ácido clavulânico (14:1) apresenta eficácia bacteriológica contra *H. influenzae* e *M. catarrhalis* produtoras de β -lactamases e estirpes de *S. pneumoniae* com reduzida suscetibilidade à penicilina⁷

⁷White AR *et al.* J Antimicrob Chemother (2004);53, Suppl. S1, i3–i20

