Fièvre chez l’enfant

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Novembre 2023

Etat fébrile sans foyer

- Plan
  - Introduction
  - Cas clinique
  - Signes d’infection bactérienne grave
  - Score clinique
  - Examens biologiques
  - Algorithme décisionnel

Introduction

- Fièvre
  - Motif
    - 20 % des consultations aux urgences
    - Première cause de consultation chez les moins de 3 ans
  - Fièvre sans foyer
    - 20% des fièvres
    - Risque d'infection bactérienne grave
      - bactériémie occulte, pneumonie, méningite, infections ostéo-articulaires, cellulite, pyélonéphrite, entérites bactériennes

Etat fébrile

- Cas clinique 1
  - Nourrisson de 6 mois
  - Appel téléphonique
  - « je le trouve chaud »
  - Conduite à tenir ?

Etat fébrile sans foyer

- Cas clinique1
  - Anamnèse
    - TEP
    - ABCD
    - Signes associés
    - Etat vaccinal
    - Contage
    - Voyage
    - ATCD
    - Prise de médicament
    - Urgences pédiatriques

Etat fébrile

- Urgences pédiatriques
  - Tri
    - TEP
    - ATS
      - 3
    - Installation infirmière
      - TEP
      - Contrôles (T°, poids, FR, FC, SaO2)

Etat fébrile

- Installer en salle de consultation
  - Objectifs de l'examen clinique
    - Recherche de signes d'infection bactérienne grave
      - Signes vitaux
      - Signes spécifiques
    - Recherche de signes d'infection localisée
      - Examen par système

Etat fébrile

Signes d'infection bactérienne grave

Table 3 Diagnostic characteristics of individual vital signs for identifying children with serious or intermediate infection vs those with minor/no infection

	Sensitivity (95% CI)	Specificity (95% CI)	Positive LR (95% CI)	Negative LR (95% CI)
Temperature ≥39.0°C	27 (22 to 32)	87 (84 to 91)	2.1 (1.5 to 2.9)	0.8 (0.8 to 0.9)
Tachypnoea	55 (49 to 61)	57 (51 to 62)	1.3 (1.1 to 1.5)	0.8 (0.7 to 0.9)
Tachycardia	62 (57 to 68)	58 (53 to 63)	1.5 (1.3 to 1.7)	0.7 (0.6 to 0.8)
CRT >2 seconds	8 (4 to 12)	100 (99 to 100)	17.7 (2.4 to 132.5)	0.9 (0.9 to 1.0)
O_2 sats ≤94%	19 (15 to 24)	93 (90 to 95)	2.7 (1.7 to 4.1)	0.9 (0.8 to 0.9)

CRT, capillary refill time; LR, likelihood ratio; O_2 sats, oxygen saturations.

How well do vital signs identify children with serious infections in paediatric emergency care?

Arch. Dis. Child. 2009;94;888-893;

Diagnostic value of clinical features at presentation to identify serious infection in children in developed countries: a systematic review

Lancet 2010; 375: 834–45

Ann Van den Bruel, Tanya Haj-Hassan, Matthew Thompson, Frank Buntinx, David Mant, for the European Research Network on Recognising Serious Infection investigators*

	Study reference	Prevalence*	Age range	Likelihood ratio (95% CI)	
				Positive	Negative
Global assessment					
Parental concern†	5	Low	<17 years	14·40 (9·30–22·10)	0·55 (0·39–0·78)
Clinician instinct that something wrong	5	Low	<17 years	23·50 (16·80–32·70)	0·38 (0·24–0·60)
Clinical impression	5	Low	<17 years	8·30 (6·25–11·10)	0·37 (0·23–0·62)
	36	Intermediate	3–36 months	1·05 (0·15–7·48)	1·00 (0·90–1·11)
	40	Intermediate	<24 months	2·75 (1·56–4·86)	0·64 (0·41–1·00)
	49‡	Intermediate	≤15 years	4·27 (2·98–6·11)	0·26 (0·12–0·56)
	42§	Intermediate	1 month to 5 years	4·14 (2·33–7·35)	0·28 (0·10–0·77)
Child appears ill	27	Intermediate	0–36 months	2·20 (1·78–2·78)	0·65 (0·55–0·77)
	24	High	1–36 months	1·40 (1·15–1·71)	0·67 (0·50–0·88)
Child behaviour					
Changed crying pattern	5	Low	<17 years	10·50 (4·62–13·20)	0·67 (0·51–0·89)
	24	High	1–36 months	0·74 (0·56–0·96)	1·30 (1·07–1·60)
	45‡	High	1 month to 15 years	0·49 (0·25–0·96)	1·16 (1·03–1·31)
Child drowsy	5	Low	<17 years	6·60 (4·17–10·50)	0·65 (0·49–0·86)
	44¶	Intermediate	3 months to 6 years	1·99 (1·29–3·08)	0·65 (0·42–1·00)
	45¶	High	1 month to 15 years	2·43 (1·82–3·26)	0·37 (0·25–0·56)
Child moaning	5	Low	<17 years	5·90 (1·97–17·70)	0·92 (0·81–1·03)
Child inconsolable	5	Low	<17 years	5·50 (2·66–11·50)	0·83 (0·69–0·99)

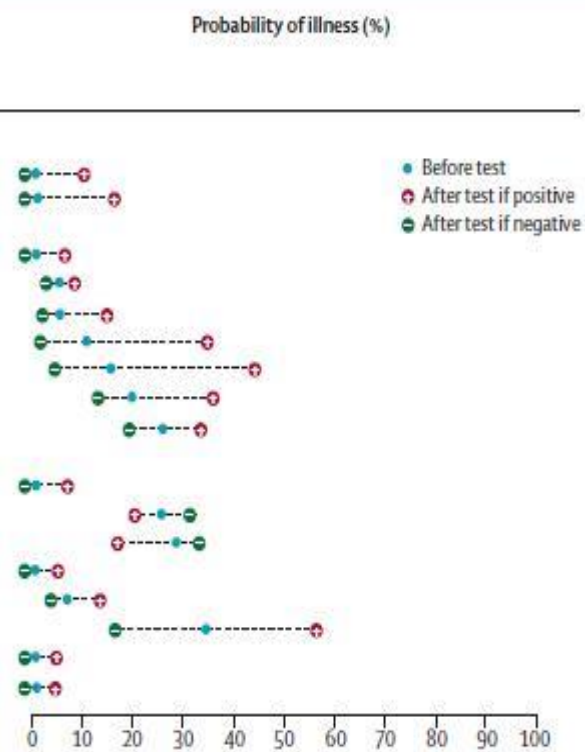

Figure 3: **Potential warning signs for serious illness (positive likelihood ratio >5·0 in at least one study)—global assessment and behavioural features**

*Setting: low prevalence of serious infection (<5%); intermediate prevalence of serious infection (5–20%); high prevalence of serious infection (>20%). †Parental concern that the illness is different from previous illness. ‡Meningococcal infection only. §Gastroenteritis causing dehydration only. ¶Meningitis only.

Diagnostic value of clinical features at presentation to identify serious infection in children in developed countries: a systematic review

Ann Van den Bruel, Tanya Haj-Hassan, Matthew Thompson, Frank Buntinx, David Mant, for the European Research Network on Recognising Serious Infection investigators*

Lancet 2010; 375: 834–45

	Study reference	Prevalence*	Age range	Likelihood ratio (95% CI)	
				Positive	Negative
Meningeal irritation	5	Low	<17 years	25·70 (3·09–213)	0·97 (0·91–1·03)
	44†	Intermediate	3 months to 6 years	275 (16·70–4526)	0·52 (0·35–0·76)
	48‡	Intermediate	>1 month to 16 years	13·90 (5·41–35·60)	0·61 (0·47–0·79)
	45†	High	1 month to 15 years	2·57 (2·16–3·06)	0·01 (0·00–0·15)
Petechial rash	5	Low	<17 years	12·50 (1·65–94·9)	0·97 (0·91–1·03)
	44†	Intermediate	3 months to 6 years	83·70 (4·50–1475)	0·86 (0·73–1·01)
	48‡§	Intermediate	>1 month to 6 years	9·00 (5·26–15·3)	0·28 (0·16–0·48)
	49‡§	Intermediate	≤15 years	7·00 (4·60–10·70)	0·19 (0·08–0·46)
	45†	High	1 month to 15 years	6·18 (2·68–14·30)	0·81 (0·73–0·91)
	32	Intermediate	1–36 months	8·90 (2·63–30·40)	0·75 (0·63–0·91)
Seizures	5	Low	<17 years	20·70 (4·83–88·60)	0·94 (0·86–1·03)
	43†¶	Intermediate	6 months to 6 years	5·90 (1·79–19·00)	0·80 (0·59–1·08)
	44†¶	Intermediate	3 months to 6 years	3·50 (1·69–7·17)	0·76 (0·58–1·00)
	45†	High	1 month to 15 years	1·68 (0·66–4·27)	0·96 (0·90–1·04)
Unconsciousness	5	Low	<17 years	19·80 (6·17–63·50)	0·91 (0·81–1·02)
	44†	Intermediate	3 months to 6 years	155 (9·03–2677)	0·73 (0·57–0·93)
Decreased skin elasticity	41‖	High	1 month to 5 years	10·70 (3·87–29·8)	0·67 (0·56–0·81)
Hypotension**	49‡	Intermediate	≤15 years	9·40 (1·99–44·70)	0·74 (0·56–0·99)
Any abnormal finding in history or physical examination	29	Intermediate	<24 months	4·42 (2·87–6·80)	0·18 (0·71–0·44)

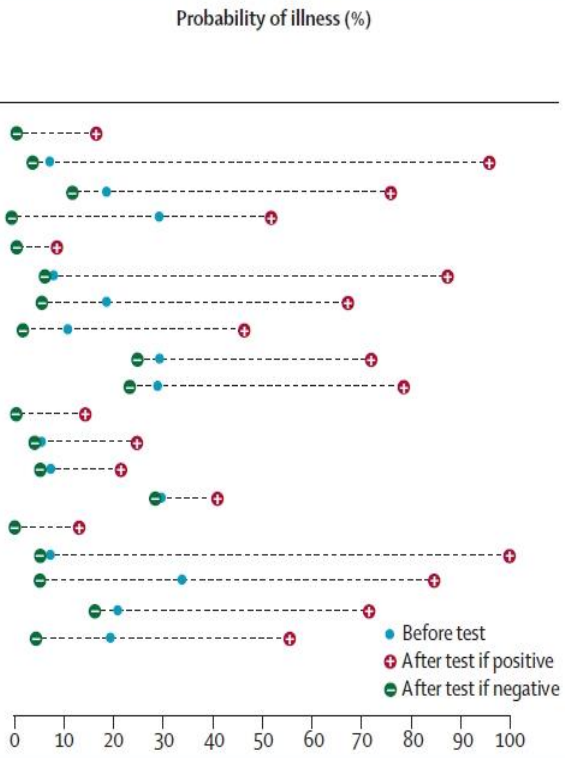

Figure 5: Potential warning signs for serious illness (positive likelihood ratio >5·0 in at least one study)—miscellaneous

*Setting: low prevalence of serious infection (<5%); intermediate prevalence of serious infection (5–20%); high prevalence of serious infection (>20%). †Meningitis only. ‡Meningococcal infection. §Diameter more than 2 mm. ¶During examination. ‖Gastroenteritis causing dehydration only. **Hypotension defined as 2 SD or more below the mean for age.

Lancet 2010; 375: 834–45

Examen d'un enfant fébrile

- Installer en salle de consultation
  - Objectifs de l’examen clinique
- Recherche d’un foyer infectieux spécifique
    - Pulmonaire
    - Cutané
    - Ostéo-articulaire
    - Neurologique
    - Urinaire
    - Orl

Etat fébrile

- Cas clinique 1
  - Pas d'ATCD particuliers
  - Vaccins Prévenar et Anti Hib à jour
  - Examen clinique
    - Température 39°
    - Pas de signes d'infection bactérienne grave
    - Pas de signes en faveur d'un foyer
  - Conclusion
  - Conduite à tenir ?

EFSF

- Risque d'infection bactérienne **occulte**
  - Avant vaccination Anti Hib
    - 10%
  - Après vaccination Anti Hib 1992
    - 5%
  - Depuis vaccination Anti pneumococcique 2002
    - < 0.5-1%

Outcomes of febrile children without localising signs after pneumococcal conjugate vaccine

E Waddle and R Jhaveri

Archives of Disease in Childhood 2009;**94**:144-147

Table 1 Background demographic data for patients before and after PCV7

	Before PCV7	After PCV7
Total emergency department visits of children ⩽3 years old	13 507	21 500
Total no. of patients with blood cultures performed	1251	2028
Patients with complete records	1184 (94.6%)	1994 (98.3%)
Patients analysed	148 (11.8%)	275 (13.6%)
% Males	54.7%	56.0%
Average age	17 ± 11 months	15 ± 10 months
Positive cultures	17 (11.5%)	14 (5.1%)
Pathogens	10 (6.8%)	1 (0.36%)
Contaminants	7 (4.7%)	13 (4.7%)

Risques d'une bactériémie occulte

TABLE 5. Serious Bacterial Infection After Oral Antibiotic Therapy*

Primary Investigators	Total No. With Occult SPB†	SBI/Oral ABX‡	SBI/No ABX	O − E§	Variance O − E	*P*
Baron et al[26]	18	1/11	1/7	−0.2	0.45	1
Bratton et al[18]	66	1/17	7/49	−1.06	1.37	.699
Dershewitz et al[30]	20	0/18	0/2	0	0	1
Hamrick and Murphy[32]	11	0/10	0/1	0	0	1
Harper et al[21]	223	7/179	4/44	−1.83	1.66	.233
Heldrich[33]	10	0/2	0/8	0	0	1
Jaffe et al[4]	36	1/20	0/16	0.45	0.25	1
McCarthy et al[34]	26	0/14	2/12	−1.08	0.48	.2
Rosenberg and Cohen[36]	45	0/11	3/34	−0.73	0.53	.57
Woods et al[11]	201	3/117	8/84	−3.4	2.54	.05
Totals	656	13/399 (3.3%)	25/257 (9.7%)	−7.9	7.3	.003

TABLE 6. Meningitis After Oral Antibiotic Therapy*

Primary Investigators	Total No. With Occult SPB†	Meningitis/ Oral ABX‡	Meningitis/ No ABX	O − E§	Variance O − E	*P*
Baron et al[26]	18	0/11	0/7	0	0	1
Bratton et al[18]	66	1/17	0/49	0.74	0.19	.26
Dershewitz et al[30]	20	0/18	0/2	0	0	1
Hamrick and Murphy[32]	11	0/10	0/1	0	0	1
Harper et al[21]	223	2/179	1/44	0.39	0.47	.49
Heldrich[33]	10	0/2	0/8	0	0	1
Jaffe et al[4]	36	0/20	0/16	0	0	1
McCarthy et al[34]	26	0/14	1/12	−0.54	0.25	.2
Rosenberg and Cohen[36]	45	0/11	3/34	−0.73	0.53	.57
Woods et al[11]	201	0/117	2/84	−1.16	0.48	.17
Totals	656	3/399 (0.8%)	7/257 (2.7%)	−1.3	1.9	.345

Do Oral Antibiotics Prevent Meningitis and Serious Bacterial Infections in Children With *Streptococcus pneumoniae* Occult Bacteremia? A Meta-analysis

Steven G. Rothrock, Marvin B. Harper, Steven M Green, Mark C. Clark, Richard Bachur, Daniel P. McIlmail, Philip A. Giordano and Jay L. Falk

Pediatrics 1997;99;438-444

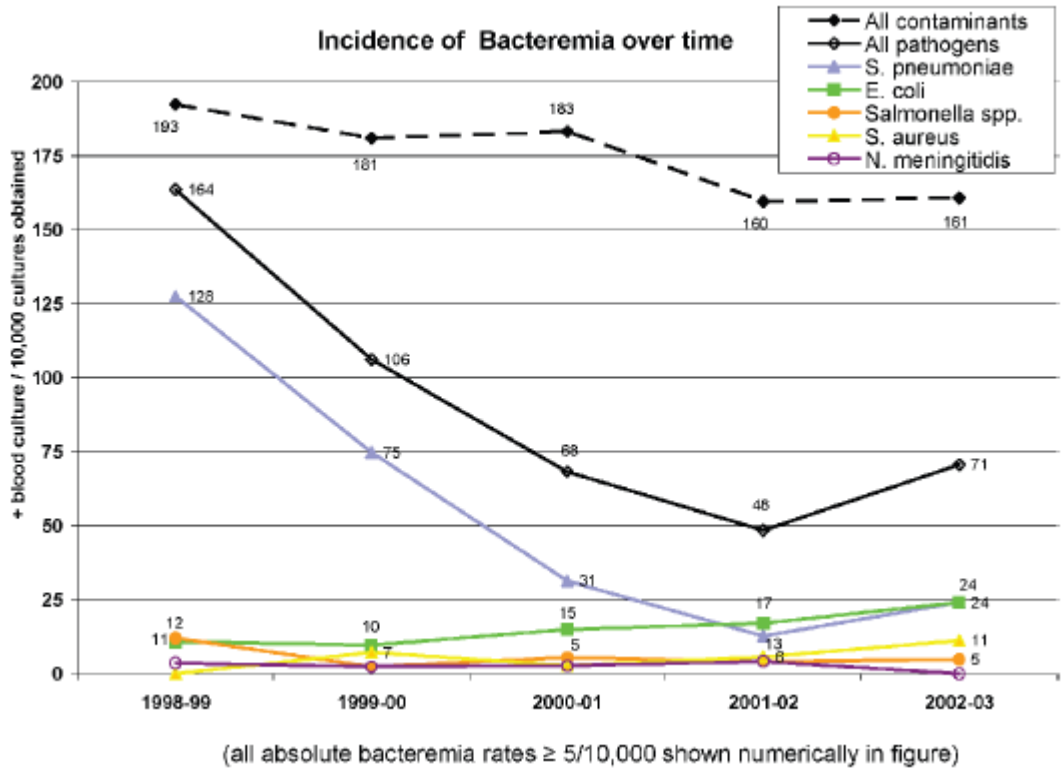

FIGURE 3. Incidence of bacteremia in previously healthy children ages 3 months–3 years presenting to outpatient settings at Kaiser Permanente Northern California from 1998 to 2003. All absolute bacteremia rates ≥5/10,000 shown numerically in figure.

Changing Epidemiology of Outpatient Bacteremia in 3- to 36-Month-Old Children After the Introduction of the Heptavalent-Conjugated Pneumococcal Vaccine

Arnd M. Herz, MD, Tara L. Greenhow, MD,† Jay Alcantara,* John Hansen, BA,‡ Roger P. Baxter, MD,§ Steve B. Black, MD,‡ and Henry R. Shinefield, MD‡*

(*Pediatr Infect Dis J* 2006;25: 293–300)

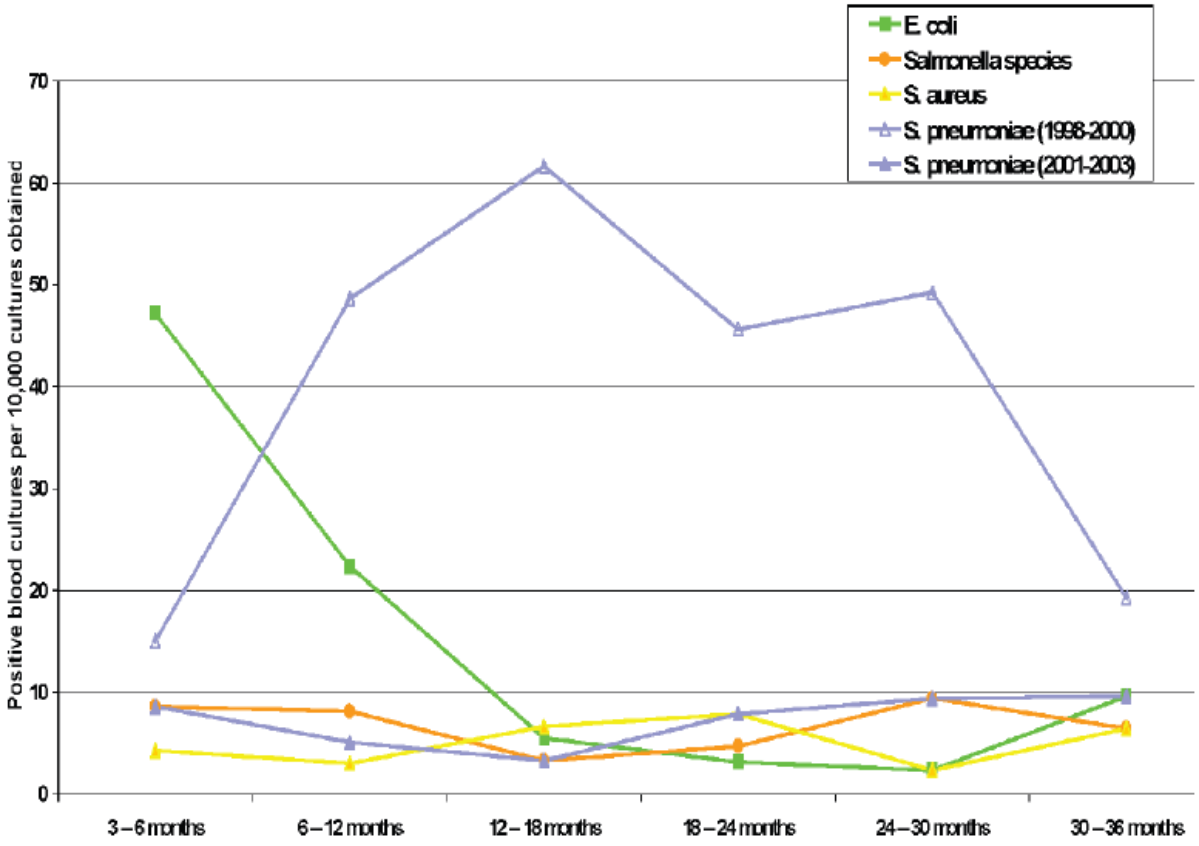

FIGURE 4. Incidence of bacteremia by age and organism, with incidence of *S. pneumoniae* bacteremia separated by time periods, that is, before and after routine conjugated pneumococcal vaccinations.

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Bacteremia in Children 3 to 36 Months Old After Introduction of Conjugated Pneumococcal Vaccines

Tara L. Greenhow, MD,[a] Yun-Yi Hung, PhD,[b] Arnd Herz, MD[c]

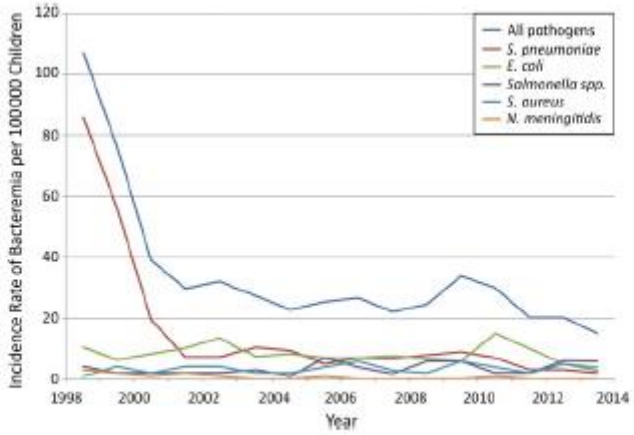

FIGURE 2
Rate of all bacteremia by organism per 100 000 children per year between 1998 and 2014.

Effects of Vaccination on Invasive Pneumococcal Disease in South Africa

N ENGL J MED 371;20 NEJM.ORG NOVEMBER 13, 2014

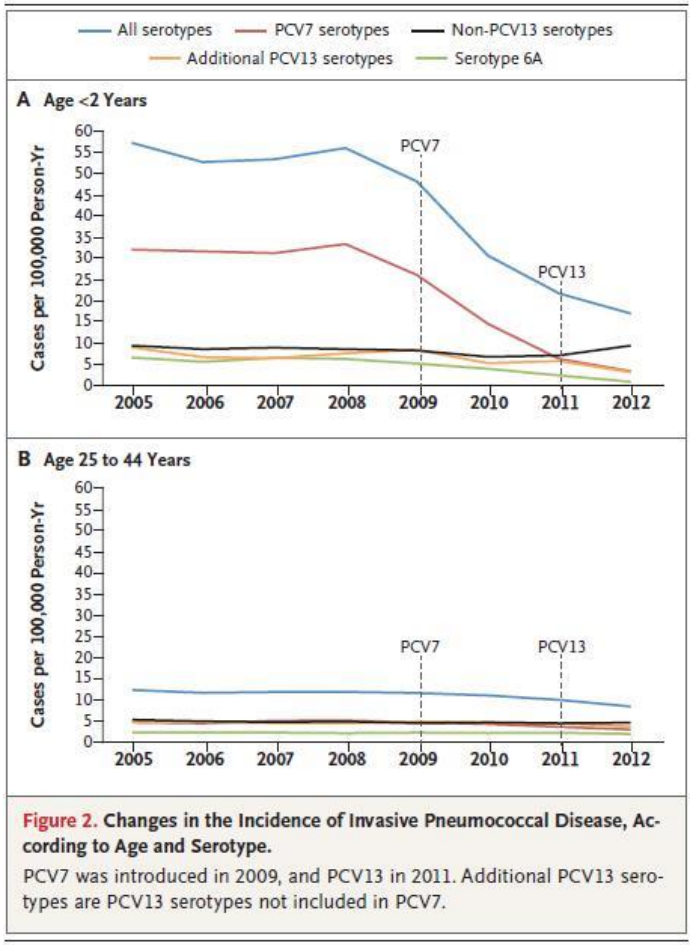

Figure 2. Changes in the Incidence of Invasive Pneumococcal Disease, According to Age and Serotype.

PCV7 was introduced in 2009, and PCV13 in 2011. Additional PCV13 serotypes are PCV13 serotypes not included in PCV7.

Bacteremia in Children 3 to 36 Months Old After Introduction of Conjugated Pneumococcal Vaccines

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TABLE 2 Incidence Rate of Bacteremia by Study Period

	Rate per 100 000 Children per Year (95% CI)			Rate per 10 000 Blood Cultures (95% CI)		
	Pre-PCV7	Post-PCV7/Pre-PCV13	Post-PCV13	Pre-PCV7	Post-PCV7/Pre-PCV13	Post-PCV13
All bacteremia	97 (79.4–117)	29 (20.4–38.9)	21 (13.5–30.3)	168 (144–195)	75 (59–94)	96 (78–117)
S pneumoniae	74.5 (59–93)	10 (5–18)	3.5 (1.1–8.7)	129 (108–153)	26 (17–38)	16 (9–26)
E coli	9.4 (4.8–17)	8.2 (4.1–15.7)	8.4 (4.1–15.7)	17 (10–27)	21 (13–32)	37 (26–51)
Salmonella spp	3.8 (1.1–8.7)	3.2 (1.1–8.7)	4.5 (1.6–10.2)	7 (3–14)	8 (3–16)	20 (12–31)
S aureus	3.1 (1.1–8.7)	4.6 (1.6–10.2)	3.5 (1.1–8.7)	6 (2–13)	9 (4–17)	16 (9–26)
N meningitides	2.5 (0.6–7.2)	0.6 (0–3.7)	0.2 (0–3.7)	4.5 (2–10)	1.5 (0–6)	1 (0–6)
Contaminated blood culture	100 (82.1–120)	75.6 (60.3–93)	45 (33–59.8)	174 (151–199)	196 (172–222)	205 (180–231)

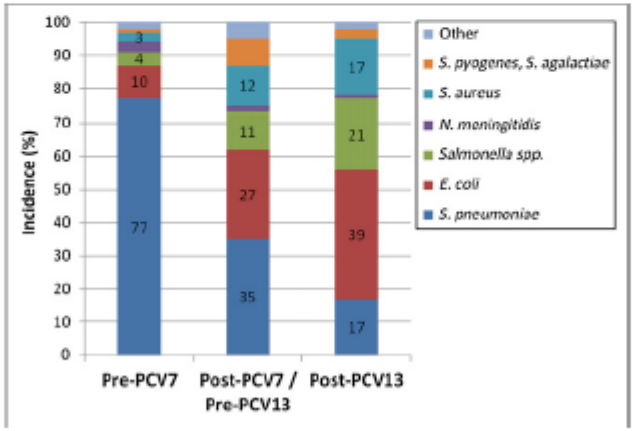

FIGURE 1
Relative incidence of bacteremia by organism per study period (pre-PCV7, post-PCV7/pre-PCV13, and post-PCV13).

Etat fébrile

- Cas clinique 1
  - Pas d'ATCD particuliers
  - Vaccins Prévenar et Anti Hib à jour
  - Examen clinique
    - Pas de signes d'infection bactérienne grave
    - Pas de signes en faveur d'un foyer
  - Conduite à tenir ?
    - Facteurs prédictifs d'une BO ?
      - Etat vaccinal
      - Score de Mc Carthy
      - Examens biologiques

Score prédictif d'une infection bactérienne grave chez les enfants de 0-36 mois

Tableau I. Score clinique pour les enfants avec un état fébrile sans foyer. Adapté de McCarthy et al. [8].

Risque clinique	Score YOS		
	1 point	3 points	5 points
Observations	Normal	Atteinte modérée	Atteinte sévère
Qualité des pleurs	Forts, tonalité normale ou content, ne pleure pas	Sanglots ou gémissements	Faibles ou plaintifs ou tonalité aiguë
Réaction à la stimulation des parents	Content, ne pleure pas ou pleure brièvement puis s'arrête de pleurer	Pleurs intermittents	Pleurs incessants ou inconsolable
État d'éveil	Si éveillé, reste éveillé Si endormi et stimulé, se réveille rapidement	Ferme les yeux brièvement puis s'éveille ou éveillable après stimulation prolongée	S'endort ou ne se réveille pas
Couleur	Rose	Extrémités pâles ou acrocyanose	Pâle ou cyanosé ou marbré ou grisâtre
Hydratation	Peau et yeux normaux et muqueuses humides	Peau et yeux normaux mais muqueuses plus ou moins sèches	Signe du pli et muqueuses sèches et/ou yeux enfoncés
Contact social	Souriant ou alerte (≤ 2 mois)	Souriant brièvement ou alerte peu de temps (≤ 2 mois)	Aucun sourire, visage anxieux sans expression ou pas alerte (≤ 2 mois)

Score minimal : 6 ; score maximal : 30.

Observation Scales to Identify Serious Illness in Febrile Children: McCarthy Pediatrics 1982;70;802-809

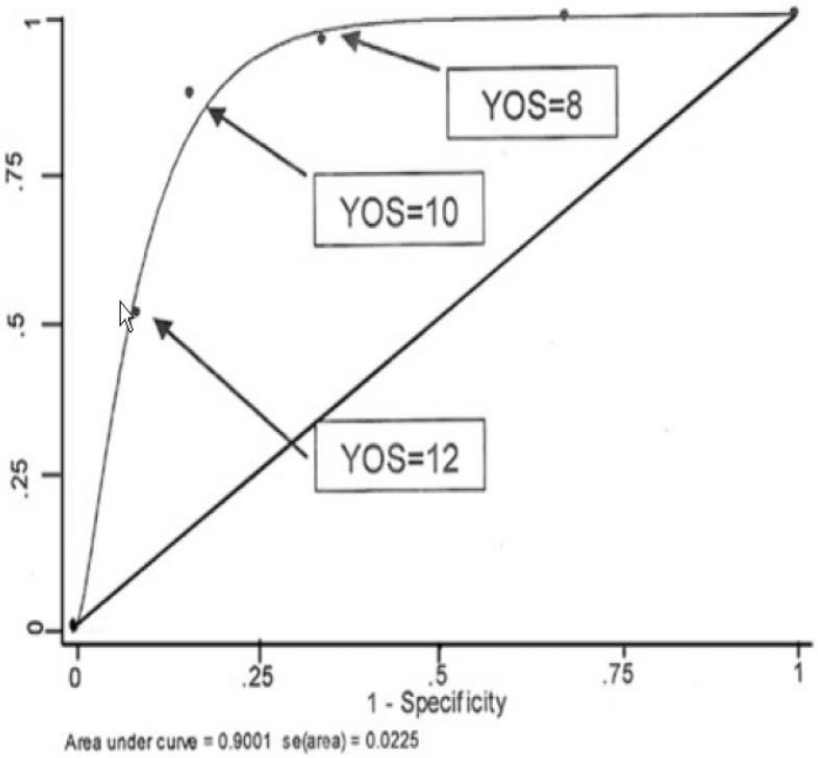

Fig. 1. ROC curve for YOS as a diagnostic test to predict bacteremia

Note: Area under curve = 0.9001; SE (area) = 0.0225

Yale Observation Scale for Prediction of Bacteremia in Febrile Children Indian J Pediatr 2009;76(6):599-604

Examens de laboratoire

- Numération leucocytaire
    - Numération des polynucléaires neutrophiles
    - Numération des neutrophiles non segmentés
- C réactive protéine
- Procalcitonine

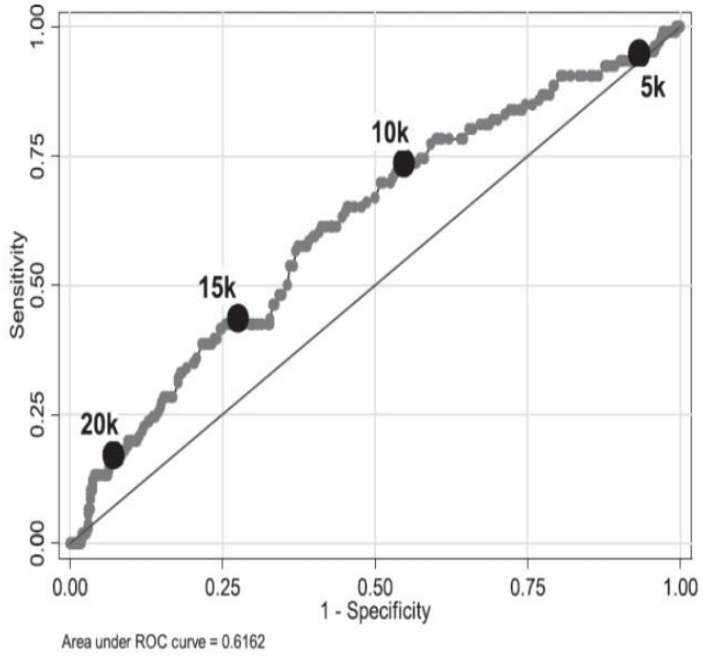

Figure 2. Receiver operating characteristic (ROC) curve for white blood cell (WBC) count as a predictor of serious bacterial infection with cutoff points for WBC count (k) pictured on the curve.

Serious Bacterial Infections in Febrile Infants in the *Post–Pneumococcal Conjugate Vaccine* Era

ACADEMIC EMERGENCY MEDICINE 2009; 16:585–590 a 2009

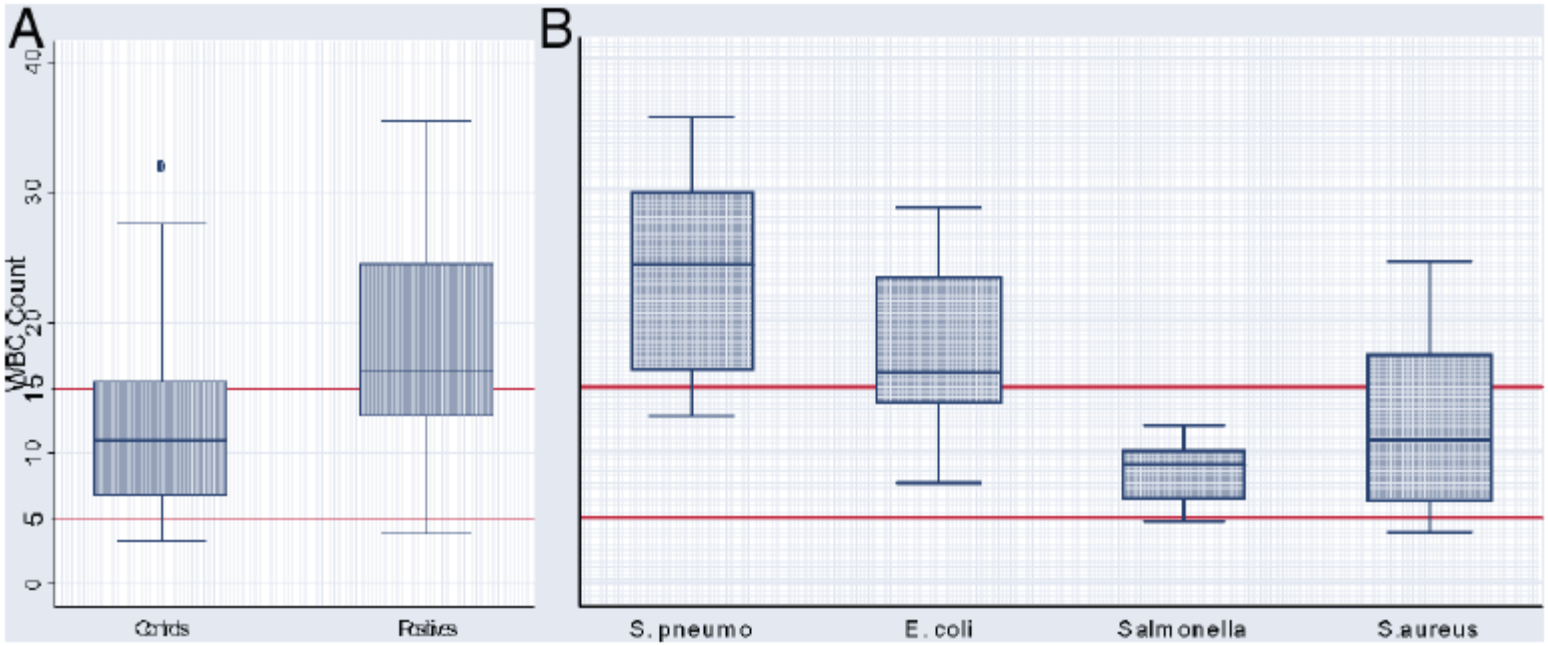

FIGURE 6. A and B, peripheral WBC count associated with bacteremia; A compares WBC from all subjects with positive blood culture and their matched controls; B compares WBC from subjects by organism identified in blood culture. Values are expressed as mean, 25th and 75th percentile and standard deviation.

Changing Epidemiology of Outpatient Bacteremia in 3- to 36-Month-Old Children After the Introduction of the Heptavalent-Conjugated Pneumococcal Vaccine

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Fever in the new millennium: a review of recent studies of markers of serious bacterial infection in febrile children

Allen L. Hsiao and M. Douglas Baker

Curr Opin Pediatr 17:56–61. © 2005

Table 3. Sensitivities and specificities for proposed CRP cutoff for detecting SBI: summary of studies examining C-reactive protein and SBI

Study	Optimum CRP (cutoff (mg/l)	CRP sensitivity	CRP specificity
Carrol*	30.0	81.0	89.0
Fernandez-Lopez	27.5	63.5	84.2
Gendrel	10.0	98.0	50.0
Galetto-Lacour 2001	40.0	89.0	75.0
Galetto-Lacour 2003	40.0	79.0	79.0
Pulliam	70.0	79.0	91.0

*Meningococcal disease only. CRP, C-reactive protein.

Procalcitonin and C-Reactive Protein as Diagnostic Markers of Severe Bacterial Infections in Febrile Infants and Children in the Emergency Department

Barbara Andreola, MD, Silvia Bressan, MD,* Silvia Callegaro, MD,* Anna Liverani, MD,† Mario Plebani, MD,† and Liviana Da Dalt, MD**

The Pediatric Infectious Disease Journal • Volume 26, Number 8, August 2007

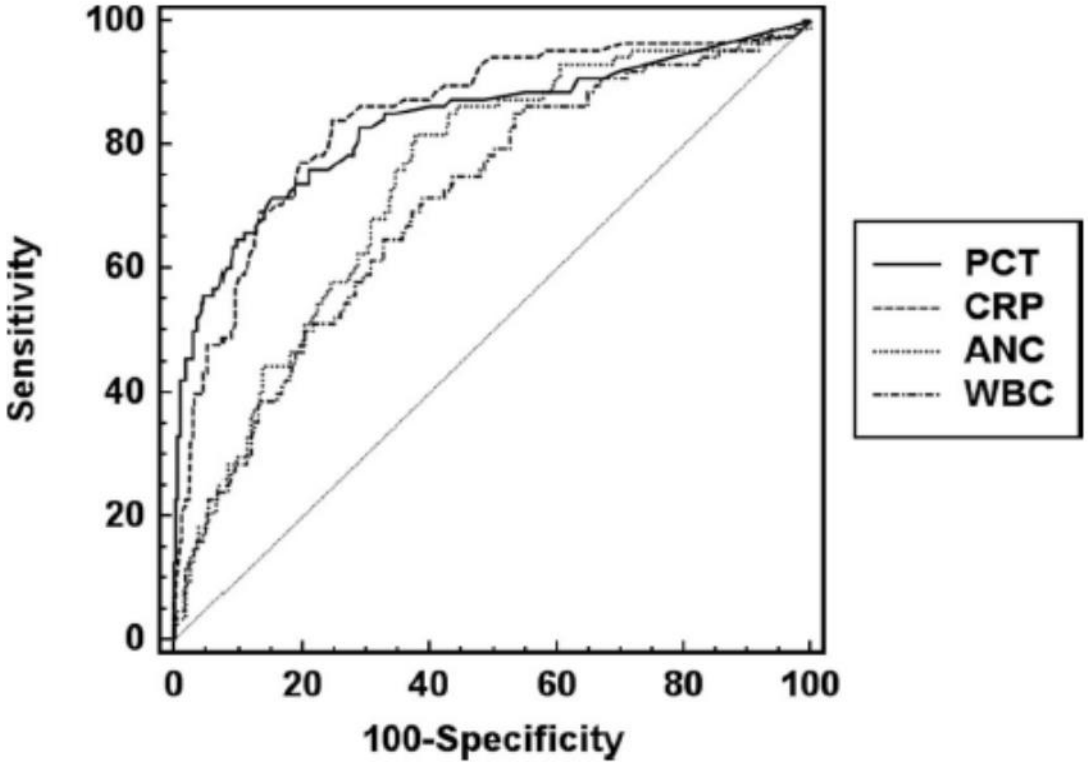


FIGURE 2. ROC for PCT, CRP, WBC count, and ANC for prediction of SBI.

A SCORE IDENTIFYING SERIOUS BACTERIAL INFECTIONS IN CHILDREN WITH FEVER WITHOUT SOURCE

Annick Galetto Lacour, MD, Samuel A. Zamora, MD, and Alain Gervaix, MD

TABLE 1. Predictive Value (%) of Different Variables Between Children With and Without Severe Bacterial Infections

	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
PCT*(0.5 ng/mL)	94 (82–99)	68 (58–76)	51 (40–63)	97 (90–99)
CRP*(40 mg/L)	81 (65–90)	76 (67–83)	55 (42–67)	92 (83–96)
Positive urine dipstick	67 (50–80)	82 (73–89)	57 (42–71)	87 (79–93)
Leucocytosis*(15 G/L)	53 (37–69)	73 (63–81)	41 (28–56)	81 (72–88)
Left shift*(1.5 G/L)	17 (8–32)	91 (84–95)	40 (20–64)	75 (67–82)
Laboratory score*(3)				
Derivation pop (n = 135)	94 (82–99)	81 (72–88)	64 (51–76)	98 (92–99)
Validation pop (n = 67)	94 (74–99)	78 (64–87)	61 (42–76)	97 (87–100)

*Cutoff level.

PPV indicates positive predictive value; NPV, negative predictive value.

Is procalcitonin useful in early diagnosis of serious bacterial infections in children?

Acta Pædiatrica, 2005; 94: 155–158

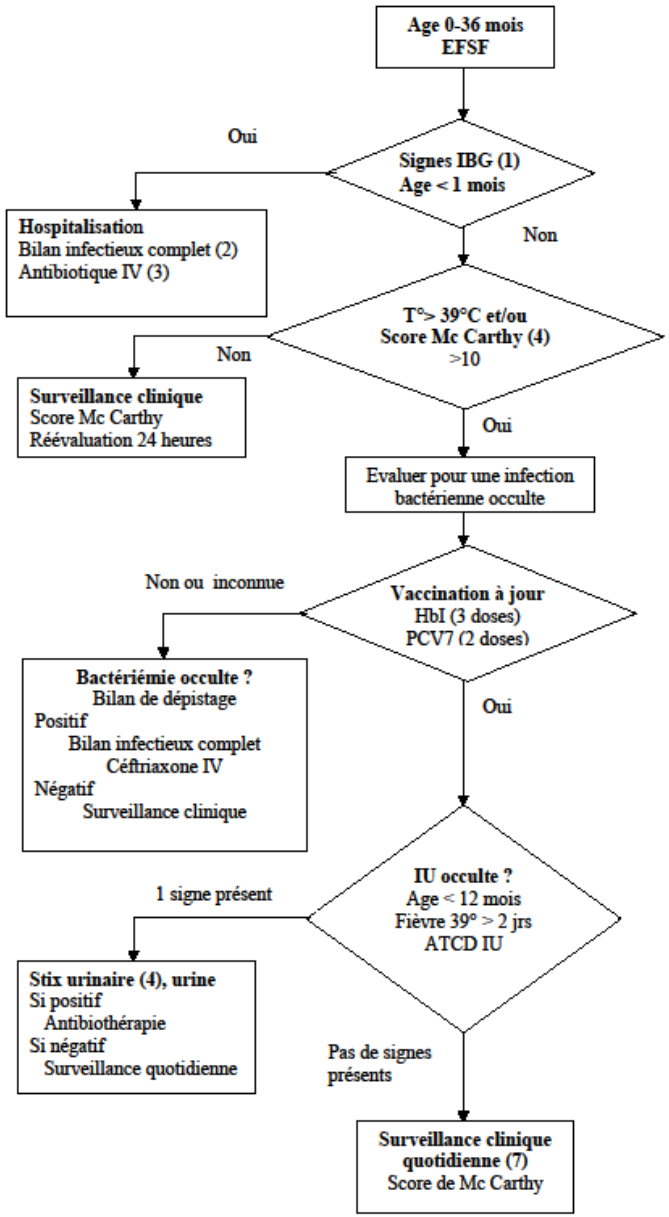
Table I. Diagnostic utility of PCT (LUMI test) compared with CRP, WBC and clinical score (McCarthy) in diagnosis of SBI.

	Sensitivity	Specificity	NPV	PPV	LR−	LR+
CRP >50 mg/l	75	68.7	95.6	23	0.36 (3%)	2.4 (20%)
PCT >0.5 ng/l	87.5	50	96.9	17.9	0.25 (2.9%)	1.7 (12%)
PCT >2 ng/l	50	85.9	93.2	30.7	0.58 (5%)	3.5 (26%)
WBC $>15 \times 10^5$/l	50	53.1	89.5	11.8	0.94 (8%)	1.1 (10%)
Combination[a]	50	95.3	93.8	57	0.52 (5%)	10.6 (54%)
McCarthy score <9	87.5	67.2	97.7	25.9	0.19 (1.6%)	2.7 (21%)

NPV: negative predictive value; PPV: positive predictive value; LR−: negative likelihood ratio; LR+: positive likelihood ratio.
Pretest probability of SBI = 11%; post-test probability in parenthesis.
[a] Positive combination test is PCT >2 + CRP >50 + WBC >15, and negative combination test is any of these negative.

risk of SBI. The diagnostic accuracy of all three markers studied (CRP, PCT, WBC) was comparable to clinical scoring and did not change post-test probabilities to a clinically useful extent. However, we noted

Prise en charge de l'état fébrile sans foyer 0-36 mois



(1) Signes d'infection bactérienne grave : Anomalies des signes vitaux, tachypnée, tachycardie, temps de recoloration cutané augmenté, cyanose, troubles de la conscience, Anomalies cliniques : mauvaise impression clinique, signes de déshydratation, purpura pétéchial, grunting, signes méningés

(2) Bilan infectieux complet : FSC, CRP, urine, sang, stix urinaire, éventuellement ponction lombaire surtout si age < 1 mois , radiographie pulmonaire et coproculture

(3) Antibiothérapie intraveineuse : si âge < 1 mois, amoxicilline-gentamycine. Si âge > 1 mois Ceftriaxone

(4) Score de Mc Carthy

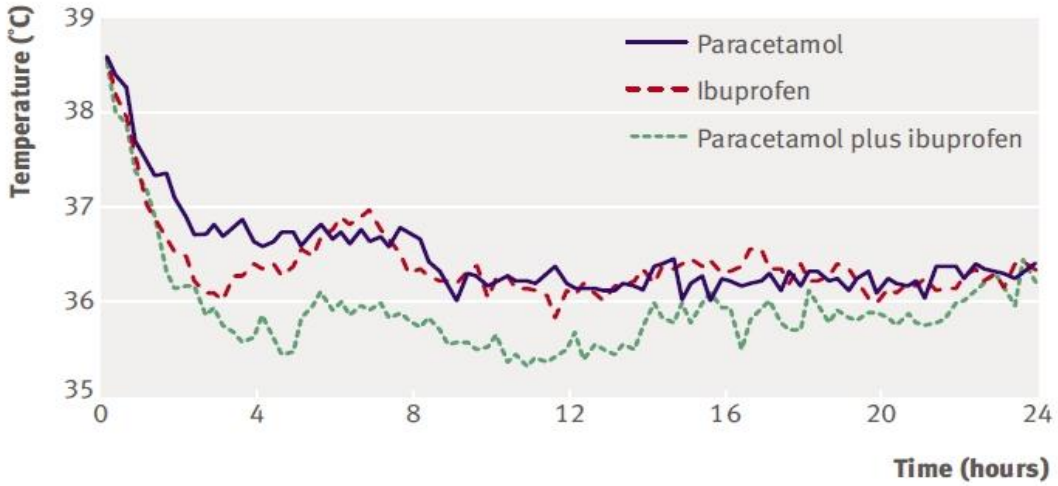
(5) Bilan infectieux de dépistage : Numération formule sanguine, C-réactive protéine : négatif si GB < 15 000/mm3 et/ou CRP < 40 mg/l. Positif si GB > 15 000/mm3 et/ou CRP < 40 mg/l

(6) Stix urinaire : Positif si leucocytes et/ou nitrites positifs, négatif si leucocytes et nitrites négatifs

(7) Surveillance clinique : hospitalière si situation pratique défavorable, immaturité parentale, longue distance, difficulté de transport ou à domicile si conditions favorables et modalités de surveillance comprises par les parents

EFSF

- Cas clinique 1
  - 6 mois
  - T°= 38°9
  - EFSF avec Score de Mc Carthy < 10
  - Vaccins à jour
  - Conduite à tenir ?
    - Conseils
      - Surveillance
      - Signes de consultation en urgence
      - Ordonnance



	Percentage of children with recorded temperatures >37.2°C at different time points (hours)												
	0*	2	4	6	8	10	12	14	16	18	20	22	24
Paracetamol	81*	36	29	25	19	25	19	19	17	15	14	12	12
Ibuprofen	85*	15	15	29	12	13	10	12	15	6	8	12	13
Paracetamol plus ibuprofen	73*	9	2	10	13	5	6	12	6	8	2	6	10

Fig 3 | Mean temperature over first 24 hours after randomisation, by treatment group. *All children had temperatures greater than 37.2°C at baseline eligibility assessment, as measured by standard digital axillary thermometry. Temperature measured using a data logger was less than 37.2°C for 19 children because of delays between digital thermometry measure and drug dosing and

Paracetamol plus ibuprofen for the treatment of fever in children (PITCH): randomised controlled trial

:hods

BMJ 2008;337:a1302

Paracetamol plus ibuprofen increased time without fever compared with paracetamol but did not differ from ibuprofen in children

Evid Based Nurs 2009 12: 41

Paracetamol (PCM) plus ibuprofen (IBF) *v* PCM *v* IBF for fever in children*

Outcomes	PCM + IBF	PCM	IBF	Adjusted difference (95% CI)	
Time without fever (<37.2°C) in the first 4 hours (min)	171	116	–	55 (33 to 78)	
	171	–	156	16 (–7 to 39)	
				RBI (CI)	**NNT**
No discomfort at 48 hours	69%	65%	–	9.4% (–26 to 33)	Not significant
				RBR (CI)	**NNH**
	69%	–	71%	3.4% (–20 to 38)	Not significant

*Abbreviations defined in glossary. RBI, RBR, NNT, NNH, and CI calculated from data in article. Difference adjusted for minimisation.

Antipyrétiques

- Fièvre
  - Activation lymphocytes
  - Activation IL 1
  - Activation synthèse immunoglobuline
  - Diminution de la croissance bactérienne
  - Diminution de la réplication virale
- Antipyrétiques
  - Diminue la réponse immunitaire
  - Prolonge la durée des symptômes

Prevalence and risk factors of suppurative complications in children with pneumonia

Patrice François (pfrancois@chu-grenoble.fr)[1], Amélie Desrumaux[2], Christine Cans[3], Isabelle Pin[2], Patricia Pavese[4], José Labarère[1]

Figure 1 Study population.

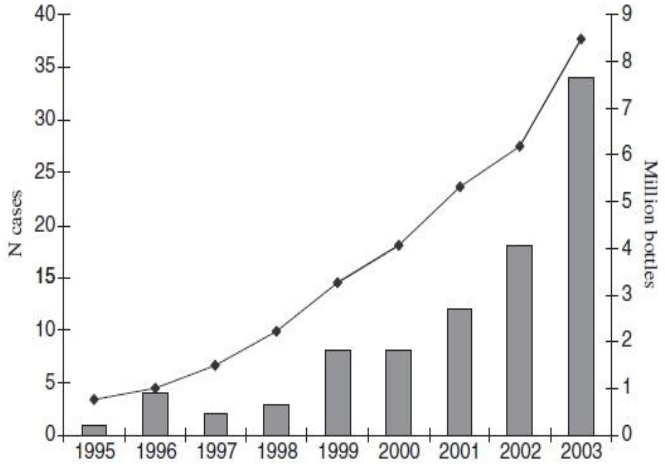


Figure 2 Progression in the annual number of cases of complicated pneumonia and paediatric-form ibuprofen sales from 1995 to 2003. number of complicated pneumonia. ibuprofen sales (million bottles).

Table 3 Unadjusted and adjusted odds ratios (OR) and 95% confidence interval (95% CI) of complicated pneumonia associated with preadmission treatments

Preadmission treatments	Univariable analysis		Multivariable analysis	
	OR (95% CI)	p	aOR (95% CI)	p
Antibiotics				
Amino-penicillin	2.07 (1.29–3.32)	<0.01	1.57 (0.91–2.72)	0.11
Cephalosporin	1.35 (0.78–2.33)	0.28	1.24 (0.67–2.30)	0.49
Macrolide	1.71 (0.88–3.32)	0.12	1.26 (0.58–2.73)	0.56
22 January 2010.;	1.63 (0.46–5.79)	0.45	2.19 (0.53–9.14)	0.28
Anti-inflammatory				
Ibuprofen	3.35 (2.08–5.38)	<0.0001	2.57 (1.51–4.35)	<0.001
Aspirin	0.74 (0.29–1.90)	0.53	1.72 (0.69–4.99)	0.31
Glucocorticoids	1.31 (0.60–2.87)	0.50	1.41 (0.58–3.41)	0.44
Other	2.20 (0.71–6.8)	0.17	2.41 (0.68–8.56)	0.17

aOR: odds ratios were adjusted for gender, age, study year, fever duration, and number of medical consultations.

Nonsteroidal Anti-Inflammatory Drug without Antibiotics for Acute Viral Infection Increases the Empyema Risk in Children: A Matched Case-Control Study

Nonsteroidal Anti-inflammatory Drugs and Childhood Empyema (ChANCE) Study Group*

(J Pediatr 2016;175:47-53).

Table I. General characteristics of the 83 cases and 83 matched controls: Univariable analyses

Characteristics	Cases (n = 83)	Controls (n = 83)	*P* value*
Male sex, n (%)	44 (53.0)	44 (53.0)	1
Age, y			
Mean ± SD	4.1 ± 2.3	3.8 ± 2.3	.41
Range	0.6-13.1	0.6-12.4	
Number of siblings, n (%)			
1	40 (48.2)	44 (53.0)	.39
2	29 (34.9)	22 (26.5)	
≥3	12 (14.5)	15 (18.1)	
NR	2 (2.4)	2 (2.4)	
Father's profession, n (%)			
Senior executive or self-employed	26 (31.3)	22 (26.5)	.54
Employee	23 (27.7)	33 (39.8)	
Farmer/craftsman, storekeeper, head of company	14 (16.9)	15 (18.1)	
Others†	17 (20.5)	12 (14.5)	
NR	3 (3.6)	2 (2.4)	
Mother's profession, n (%)			
Senior executive or self employed	25 (30.1)	23 (27.7)	.55
Employee	35 (42.2)	31 (37.3)	
Farmer/craftswoman, storekeeper, head of company	3 (3.6)	4 (4.8)	
Others†	17 (20.5)	23 (27.7)	
NR	3 (3.6)	2 (2.4)	
Site of viral infection,‡ n (%)			
Upper respiratory tract	52 (62.7)	48 (57.8)	.21
Lower respiratory tract	19 (22.9)	28 (33.7)	
Others	12 (14.5)	7 (8.4)	
Fever on day 1 of viral infection, n (%)			
No	40 (48.2)	27 (32.5)	.19
Yes	37 (44.6)	42 (50.6)	
NR	6 (7.2)	14 (16.9)	
Vaccinated with PCV-7,‡ n (%)	45 (54.2)	48 (57.8)	.62
Drug used on day 1 of viral infection			
Antibiotic intake, n (%)	7 (8.4)	12 (14.5)	.21
Beta-lactam agent	5	9	
Macrolide	1	1	
Others	1	3	
NSAID intake, n (%)	32 (38.6)	22 (26.5)	.08
Ibuprofen	32	21	
Ketoprofen	0	1	
Other antipyretic intake, n (%)	39 (46.9)	41 (49.4)	.79
Acetaminophen	39	41	

Nonsteroidal Anti-Inflammatory Drug without Antibiotics for Acute Viral Infection Increases the Empyema Risk in Children: A Matched Case-Control Study

Nonsteroidal Anti-inflammatory Drugs and Childhood Empyema (ChANCE) Study Group*

(J Pediatr 2016;175:47-53).

Table IV. Conditional and unconditional logistic-regression multivariable analyses: Final models acute viral infection-onset to drug-intake interval (0-72 h, N = 166)

	Conditional		Unconditional	
Drug exposure	**OR [95% CI]**	***P*-Value**	**OR [95% CI]**	***P* value**
Antibiotic				
<6 d	Reference		Reference	
≥6 d	0.32 [0.11-0.97]	.04	0.33 [0.12-0.91]	.03
NSAID				
0	Reference		Reference	
≥1 d	2.79 [1.40-5.58]	.004	2.82 [1.49-5.34]	.002

Our results strongly support the idea that NSAIDs increase risk of empyema in children with previous acute viral infection and suggest that NSAIDs interact with antibiotics. These findings suggest that NSAIDs should not be recommended as a first-line antipyretic treatment during acute viral infections in children. ■

Predicting Complicated Parapneumonic Effusion in Community Acquired Pneumonia: Hospital Based Case-Control Study

Department of Pediatrics, King George's Medical University, Lucknow, Uttar Pradesh 226003, India

The Indian Journal of Pediatrics (February 2019) 86(2):140–147

Table 1 Comparison of socio-demographic variables among cases and controls

Socio-demographic variables	Cases $N = 30$ (%)	Controls $N = 118$ (%)	P Value
Age			
2–24 mo	8 (26.6)	94 (79.6)	0.001
25–59 mo	22 (73.3)	24 (20.3)	
Sex			0.147
Male	20 (66.6)	92 (78)	
Female	10 (33.3)	26 (28)	

Table 4 Forward and step-wise logistic regression model to predict CPE/empyema (Log likelihood ratio 24.1, p value <0.0001)

Sl.No	Variable	p adjusted odds ratio (95%CI)	p value
1	Pre hospitalization treatment with ibuprofen	6.8 (1.07–43.6)	0.042
2	Presence of infectious focus elsewhere	28.2 (1.4–563.1)	0.029
3	Hypoalbuminemia <3.1 g/dL	6.9 (1.22–39.3)	0.028
4	Serum C-reactive protein levels >20 mg/dL	59.0 (1.86–1874.7)	0.021
4	Hemoglobin levels <10 g/dL	21.1 (2.8–158.1)	0.003
6	Total leucocyte counts >10,000 cells/cumm	37.0 (5.7–239.8)	0.000

Ibuprofène/complications infectieuses

- Etudes
  - «lien entre l'exposition à l'Ibuprofène et les différentes complications infectieuses»
  - Niveau de preuve modéré
  - Etudes avec de nombreux biais potentiels
  - Etudes rétrospectives
  - Etudes cas-témoins
- Ibuprofène
  - Retard au diagnostic en masquant les effets de la maladie ?
  - Altération des défenses immunitaires ?

Ibuprofene/ complications infectieuses

- Etudes in Vitro
  - Phase initiale
    - Inhibe la sécrétion des prostaglandines, des leucotriènes
    - Limite le recrutement, la migration des polynucléaires et leur fonction de phagocytose, d'adhésion et de dégranulation
    - Altère les capacités de défense immunitaire antibactérienne
  - Phase secondaire
    - Inhibe cyclo-oxygénase COX-2
    - Inhibe la libération des médiateurs spécialisés dans la résolution de l'inflammation
    - Favorise la pérennisation de l'inflammation

Review

Risks Related to the Use of Non-Steroidal Anti-Inflammatory Drugs in Community-Acquired Pneumonia in Adult and Pediatric Patients

Guillaume Voiriot [1,2,3,*], Quentin Philippot [1], Alexandre Elabbadi [1], Carole Elbim [4], Martin Chalumeau [5,6] and Muriel Fartoukh [1,2,3]

J. Clin. Med. **2019**, *8*, 786; doi:10.3390/jcm8060786

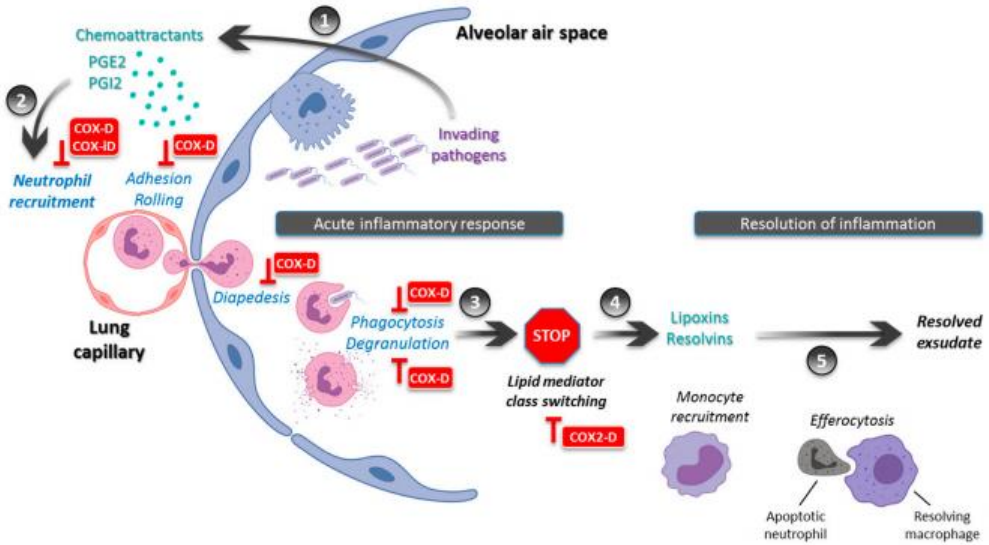


Figure 1. During pneumonia, NSAIDs may interfere with acute inflammation response and resolution.

Ibuprofène/Paracétamol

Recommandations internationales

Guidelines for the symptomatic management of fever in children: systematic review of the literature and quality appraisal with AGREE II

Elena Chiappini, Barbara Bortone, Luisa Galli, Maurizio de Martino

Table 3 Specific recommendations

Specific recommendations	AAP[2]	SIP[27]	South- Africa[30]	NICE[44]	NSW[47]	SA[48]	WHO[49]
Age of target population	Not specified	0–18 years	Not specified	<5 years	1 month –5 years	<3 years	<5 years
Indications and treatment goals							
Antipyretics are indicated to improve overall comfort of the febrile child	✔	✔	✔	✔	✔	✔	✔
Antipyretics should not be used with the aim of reducing body temperature	✔	✔	✔	✔	✔	nr	✔
Fever response to antipyretics is not a predictor of serious illness	nr	✔	✔	✔	✔	nr	nr
Antipyretics do not prevent febrile convulsions	✔	✔	✔	✔	nr	✔	nr
Antipyretics are not indicated to prevent vaccine reaction	✔	✔	✔	nr	nr	nr	nr
Antipyretics are not indicated to treat vaccine reaction	nr	nr	✔	nr	nr	nr	nr
Physical management							
The use of physical devices is not recommended	nr	✔	nr	nr	✘*	nr	✘†
Children with fever should not be under-dressed or over-wrapped	nr	✔	✔	✔	✘*	nr	✘†
The use of alcoholic baths is not an appropriate cooling method	✔	✔	nr	nr	✔	nr	nr
Tepid sponging is not recommended for the treatment of fever	✔	✔	✔	✔	✔	nr	nr
Pharmacological management							
Consider using either paracetamol or ibuprofen in children with fever who appear distressed	✔	✔	✔	✔	✔	✔	✔
Paracetamol from the age of	3 months‡	Birth§	3 months	nr	Birth	Birth§	2 months
Ibuprofen from the age of	6 months	nr	3 months	nr	6 months		2 months
Paracetamol oral dose (mg/kg/dose)	10–15 (Sup. table 1)	10–15 (Sup. table 1)	15 (Sup. table 1)	nr	15 (Sup. table 1)	15 (Sup. table 1)	10–15 (Sup. table 1)
Paracetamol dose in newborns (mg/kg/dose)	nr	– 10 (<32 weeks) – 10–15 (>32 weeks) (Sup. table 2)	nr	nr	nr	15 (Sup. table 2)	✘
Initial loading dose of paracetamol (oral, rectal) is not recommended	✔	nr	nr	nr	nr	nr	nr
Ibuprofen dose mg/kg/dose	10	10 (Sup. table 3)	10 (Sup. table 3)	nr	10 (Sup. table 3)	5–10 (Sup. table 3)	5–10 (Sup. table 3)
Combination of paracetamol/ibuprofen is not recommended	✘¶	✔	✔	✔	nr	✔	nr
Alternating paracetamol/ibuprofen is not recommended	✘¶	✔	✔	✘**	✔	✘**	nr
Oral administration of paracetamol is preferred to rectal	nr	✔	nr	nr	nr	nr	nr
Rectal administration is allowed only if the oral is not feasible	nr	✔	nr	nr	nr	nr	nr
Mefenamic acid from 6 months of age may be an alternative to ibuprofen in children with fever	nr	nr	✔	nr	nr	nr	nr

Continued

Guidelines for the symptomatic management of fever in children: systematic review of the literature and quality appraisal with AGREE II

Elena Chiappini, Barbara Bortone, Luisa Galli, Maurizio de Martino

Chiappini E, *et al. BMJ Open* 2017;**7**:e

Table 3 Continued

Specific recommendations	AAP[2]	SIP[27]	South- Africa[30]	NICE[44]	NSW[47]	SA[48]	
Age of target population	**Not specified**	**0–18 years**	**Not specified**	**<5 years**	**1 month –5 years**	**<3 years**	**<5 years**
Doses have to be calculated on weight, not on age	nr	✔	✔	nr	nr	nr	nr
Avoid combination of antipyretics and 'cough and cold medicines'	✔	✔	✔	nr	nr	nr	nr
Use only the measuring device provided	nr	✔	✔	nr	nr	nr	nr
Contraindications/precautions							
Ibuprofen does not seem to worsen asthma symptoms	✔	✔††	Caution	nr	nr	Caution	nr
Paracetamol does not seem to worsen asthma symptoms	✔	✔	nr	✔	nr	nr	nr
Ibuprofen is indicated in children with dehydration	Caution	✘	Caution	Not conclusive	nr	Caution	nr
Ibuprofen is indicated in children with varicella	Caution	✘	Caution	Not conclusive	nr	nr	nr
Caution using antipyretics in other chronic diseases	✔	✔	✔	nr	nr	nr	nr
Intoxication							
In the case of suspected poisoning with paracetamol take the child to emergency department or poison centre	nr	✔	nr	nr	nr	nr	✔‡‡

✔agree; ✘disagree; nr, not reported; Sup. table: supplementary table.
*Unwrapping an overdressed child is appropriate.[47]
†Undressing the child t is recommended to reduce the fever.[49]
‡In children <3 months it can be administered only after medical advice.[2]
§In children <3 months it can be administered by adapting the dosage and intervals to the gestational age.[47 48]
¶Insufficient evidence to support or refuse the routine use of combination treatment.[2]
**Alternating the two drugs is possible if discomfort persists or recurs using only one antipyretic.[44 48]
††Ibuprofen is contraindicated in known cases of asthma related to non-steroidal anti-inflammatory drugs.[27]
‡‡Management of paracetamol intoxication is reported in chapter 1: Triage and emergency conditions/common poisoning.[49]
AAP, American Academy of Pediatrics; NICE, National Institute for Health and Care Excellence; NSW, New South Wales Ministry of Health; SA, South Australian Ministry of Health; SIP, Italian Pediatric Society.

Conclusion

- Objectifs du traitement
  - Améliorer le confort de l'enfant
  - Diminuer les effets secondaires des antipyrétiques
- Recommandations
  - Monothérapie > Alternative ou combinée
  - Paracétamol = Ibuprofène (efficacité)
  - Paracétamol > Ibuprofène (éventuels effets secondaires)
  - Posologie
    - Paracétamol
      - 10-15 mg/kg dose 4 à 6 par jour
    - Ibuprofène
      - 5-10 mg/kg/dose 3 à 4 fois par jour

Antipyrétiques

- **Indications**

  < 2 mois T°> 38°5

  > 2 mois ?

  Quand fièvre associée à un inconfort
  avec douleur, inconfort, léthargie, détresse vitale

- **Quel choix de médicament?**

  Paracétamol 15 mg/kg/dose toutes les 6 heures (max 60 mg/kg/j)

  Ibuprofène 10 mg/kg/dose toutes les 8 heures (max 30 mg/kg/j)

- **Mode d'administration**

  PO > IR, Monothérapie > bithérapie

- **Précautions d'emploi**

  Ibuprofène

  - Age < 3- 6 mois, varicelle
  - Déshydratation ?, infection cutanée SA ?, pneumonie ?

Conclusion

- Etat fébrile
  - Signes vitaux ?
  - Signes d'infection bactérienne grave ?
  - Signes d'infection localisée ?
- EFSF
  - Vaccination
    - Disparition des infections à Hib
    - Diminution des infections à pneumocoque (PCV13 ?)
  - Prévalence bactériémie occulte faible
    - Modification des germes en cause
      - Infections urinaires prédominantes
  - Intérêt des marqueurs inflammatoires moindre
    - Indications diminuées
- Antipyrétiques
  - Indications