Associazione Neurologia Emergenza Urgenza

VII CONGRESSO ANEU

CONTROVERSIE IN NEUROLOGIA D'EMERGENZA E URGENZA

MODERATORI: **D. Goletti,** Roma - **S. Ferrari,** Verona

15:30 Meningiti ad eziologia rara
C. Tascini, Udine

ma batteriche?

Prof Carlo Tascini
Direttore Clinica Malattie Infettive
ASUFC – Malattie Infettive
Udine

Conflict of interest Disclosure

prof. Carlo Tascini has received in the last two years grants as a speaker at symposia from:

- Astrazeneca
- AVIR Pharma
- Merck
- Pfizer
- Astellas
- Angelini
- Gilead
- Novartis
- Biotest
- Thermofischer
- Correvio/Advanz Pharma
- Basilea
- Biomerieux
- Hikma
- Zambon

Community-acquired bacterial meningitis in adults in the Netherlands, 2006–14: a prospective cohort study

Lancet, 2016

Merijn W Bijlsma, Matthijs C Brouwer, E Soemirien Kasanmoentalib*, Anne T Kloek*, Marjolein J Lucas*, Michael W Tanck*, Arie van der Ende*, Diederik van de Beek*

Findings We assessed 1412 episodes of community-acquired bacterial meningitis. Incidence declined from 1·72 cases per 100 000 adults per year in 2007–08, to 0·94 per 100 000 per year in 2013–14. *Streptococcus pneumoniae* caused 1017 (72%) of 1412 episodes. Rates of adult bacterial meningitis decreased most sharply among pneumococcal serotypes included in paediatric conjugate vaccine, and in meningococcal meningitis. We found no evidence of serotype or serogroup replacement. The overall case fatality rate was 244 (17%) of 1412 episodes and unfavourable outcome occurred in 531 (38%) of 1412 episodes. Predictors of unfavourable outcome were advanced age, absence of otitis or sinusitis, alcoholism, tachycardia, lower score on the Glasgow Coma Scale, cranial nerve palsy, a cerebrospinal fluid white-cell count lower than 1000 cells per µL, a positive blood culture, and a high serum C-reactive protein concentration. Adjunctive dexamethasone was administered for 1234 (89%) of 1384 assessed episodes. The multivariable adjusted odds ratio of dexamethasone treatment for unfavourable outcome was 0·54 (95% CI 0·39–0·73).

	Data
Age (years)	61 (47–69)
Men	707/1412 (50%)
History of meningitis	93/1396 (7%)
Symptoms <24 h	636/1353 (47%)
Seizures	98/1353 (7%)
Pretreatment with antibiotics	152/1377 (11%)
Otitis or sinusitis	480/1404 (34%)
Pneumonia	122/1347 (9%)
Endocarditis	17/1346 (1%)
Cerebrospinal fluid leak	39/1374 (3%)
Immunosuppressive drugs	107/1391 (8%)
History of splenectomy	32/1412 (2%)
History of cancer	173/1407 (12%)
Diabetes	171/1394 (12%)
HIV positive	12/1412 (1%)
Alcoholism	82/1412 (6%)
Symptoms and signs on presentation	
Headache	1015/1223 (83%)
Nausea	713/1159 (62%)
Neck stiffness	977/1322 (74%)
Rash	116/1412 (8%)
Heart rate (beats per min)*	100 (84–112)
Systolic blood pressure (mm Hg)†	142 (125–163)
Diastolic blood pressure (mm Hg)†	80 (69–90)
Body temperature (°C)	38·9 (37·9–39·6)
≥38°C	1033/1391 (74%)
Score on Glasgow Coma Scale	11 (9–14)
<14 (altered mental status)	996/1403 (71%)
<8 (coma)	185/1403 (13%)
Triad fever, neck stiffness, or altered mental status	563/1389 (41%)
Cranial nerve palsy	109/1245 (9%)
Aphasia, hemiparesis, or monoparesis	268/1221 (22%)
Indices of CSF inflammation	
Opening pressure >400 mm water	253/480 (53%)
White cell count (cells per µL)	2310 (547–6840)
<100	149/1352 (11%)
100–999	316/1352 (23%)
≥999	887/1352 (66%)
Protein (g/L)‡	3·9 (2·3–6·0)
CSF:blood glucose ratio§	0·04 (0·0–0·3)
Positive Gram stain	1057/1245 (85%)
Positive blood culture	927/1243 (75%)

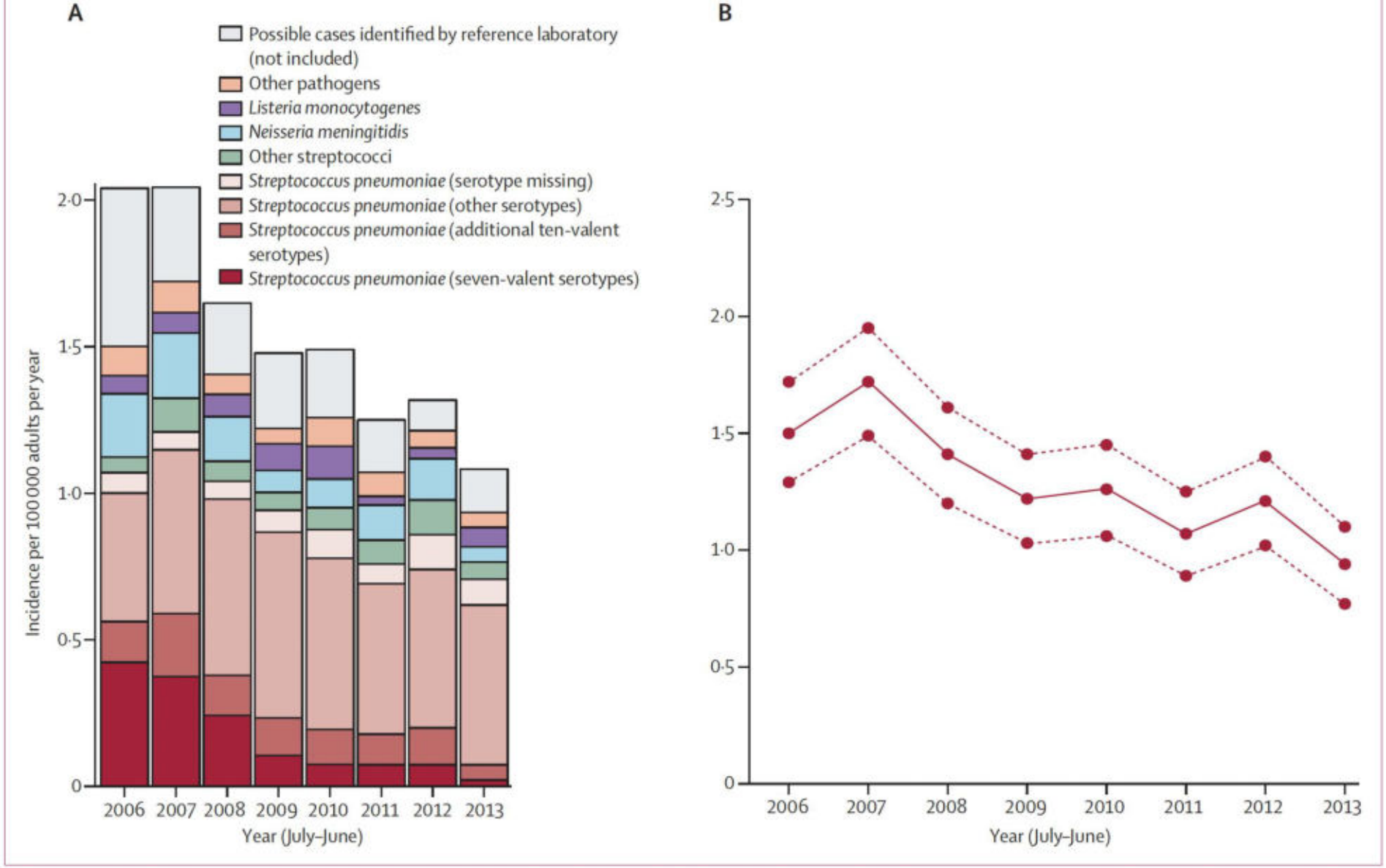


Figure 2: **Incidence of community-acquired bacterial meningitis in the Netherlands for 2006–14**

(A) Incidence rate per 100 000 adults per year of all episodes reported to the Netherlands Reference Laboratory for Bacterial Meningitis. (B) Incidence rate with 95% CIs of all included episodes of community-acquired meningitis per 100 000 adults per year. Not all patients could be included in the first months of the study because of pending ethical approval in several hospitals. Routine vaccination against *S pneumoniae* at 2 months, 3 months, 4 months, and 11 months of age with the seven-valent conjugate vaccine was started in 2006, and replaced by a ten-valent conjugate vaccine in 2011. Children aged 1–19 years were offered a single meningococcal serogroup C vaccination in 2002, and routine vaccination at 14 months was subsequently introduced.

Meningitaly

- Studio osservazione prospettico multicentrico sulle meningiti batteriche in Italia
- Anni 2016-2018
- Napoli, Roma, Milano, Cremona, Alessandria, Perugia, Arezzo, Cremona, Udine
- 170 casi raccolti

Olanda 8 anni

	n/N (%)
*Streptococcus pneumoniae**	1017/1412 (72%)
7F	110/930 (12%)
3	106/930 (11%)
8	78/930 (8%)
22F	68/930 (7%)
23F	44/930 (5%)
19A	40/930 (4%)
19F	34/930 (4%)
39 other serotypes†	450/930 (48%)
Neisseria meningitidis	150/1412 (11%)
Serogroup B	113/137 (82%)
Serogroup Y	10/137 (7%)
Serogroup C	10/137 (7%)
Other serogroups	4/137 (3%)
Listeria monocytogenes	74/1412 (5%)
Haemophilus influenzae	47/1412 (3%)
Streptococcus pyogenes	24/1412 (2%)
Streptococcus agalactiae	21/1412 (1%)
Other streptococcal species‡	35/1412 (2%)
Staphylococcus aureus	21/1412 (1%)
Other§	23/1412 (2%)

Meningitaly 3 anni

Patogeno	n/N (%)
S. pneumoniae (no sierotipi)	81/170 (48%)
N. meningitidis	38/170 (22%)
Sierogruppo B	12/38 (31%)
Sierogruppo C	10/38 (26%)
Sierogruppo Y	12/38 (31%)
Sierogruppo W135	2/38 (5%)
L. monocytogenes	24/170 (14%)
H. influenzae	4/170 (2%)
S. pyogenes	1/170 (0,5%)
S. agalactiae	4/170 (2%)
Altri streptococchi	1/170 (0,5%)
S. aureus	1/170 (0,5%)
Altri	9/170 (3,5%)

9 casi negativi
Altri: 2 E. coli (adulti), 2 P. aeruginosa, 1 Klebsiella,
1 Enterococco, 1 Enterobacter,

Esperienza personale

- A Pisa 18 anni: solo 10 casi di meningococco
- A Napoli: vedi dopo
- A Udine: dal 2010 al 2019 2 soli casi di meningococco
- Dallo scoppio del COVID scomparsa dell’influenza e delle meningiti
- Le meningiti batteriche sono una rarità per i mei specializzandi

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Neisseria meningitidis	5	8	9	12	18 (1+)	10	13 (1+)	14 (1+)	29 (1+)	18 (1+)	*19 (9+)*
Streptococcus pneumoniae	14	9	14	17 (4+)	20 (6+)	29 (1+)	27 (5+)	23 (6+)	25 (6+)	33 (10+)	*28 (3+)*
Non noto	28	23	39	14	15	13	11	15	9	11	*1*
Altri streptococchi	--	1	3	1	4	3	2	2	1	3	*4*
Haemophilus	--	--	2	1	--	2	--	2	3	4	*1*
Stafilococchi	--	--	3	1	4	1	--	3	--	--	--
Listeria	--	--	--	3	5	5	1	1	2	4	*3*
Altri batteri	--	--	--	1	1	2	3	2	5	5	*1*
Totale	**47**	**41**	**70**	**50**	**67**	**65**	**57**	**62**	**74**	**78**	***57***

INFLAMMATORY-IMMUNE RESPONSE IN SEPSIS

The Journal of Clinical Investigation REVIEW

Sepsis-induced immune dysfunction: can immune therapies reduce mortality?

jci.org Volume 126 Number 1 January 2016

Matthew J. Delano[1] and Peter A. Ward[2]

[1]Department of Surgery, Division of Acute Care Surgery, University of Michigan, Ann Arbor, Michigan, USA. [2]Department of Pathology, University of Michigan Medical School, Ann Arbor, Michigan, USA.

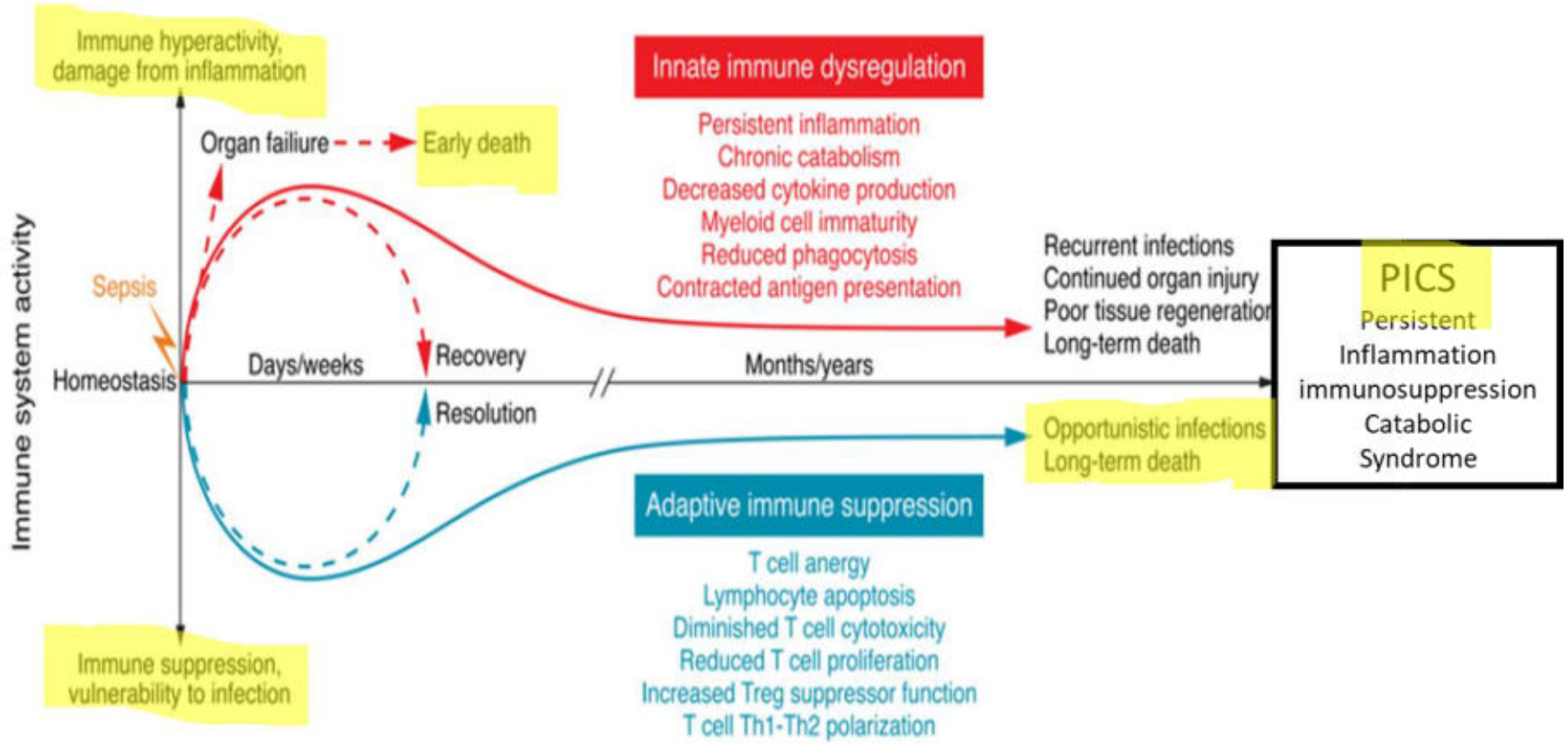
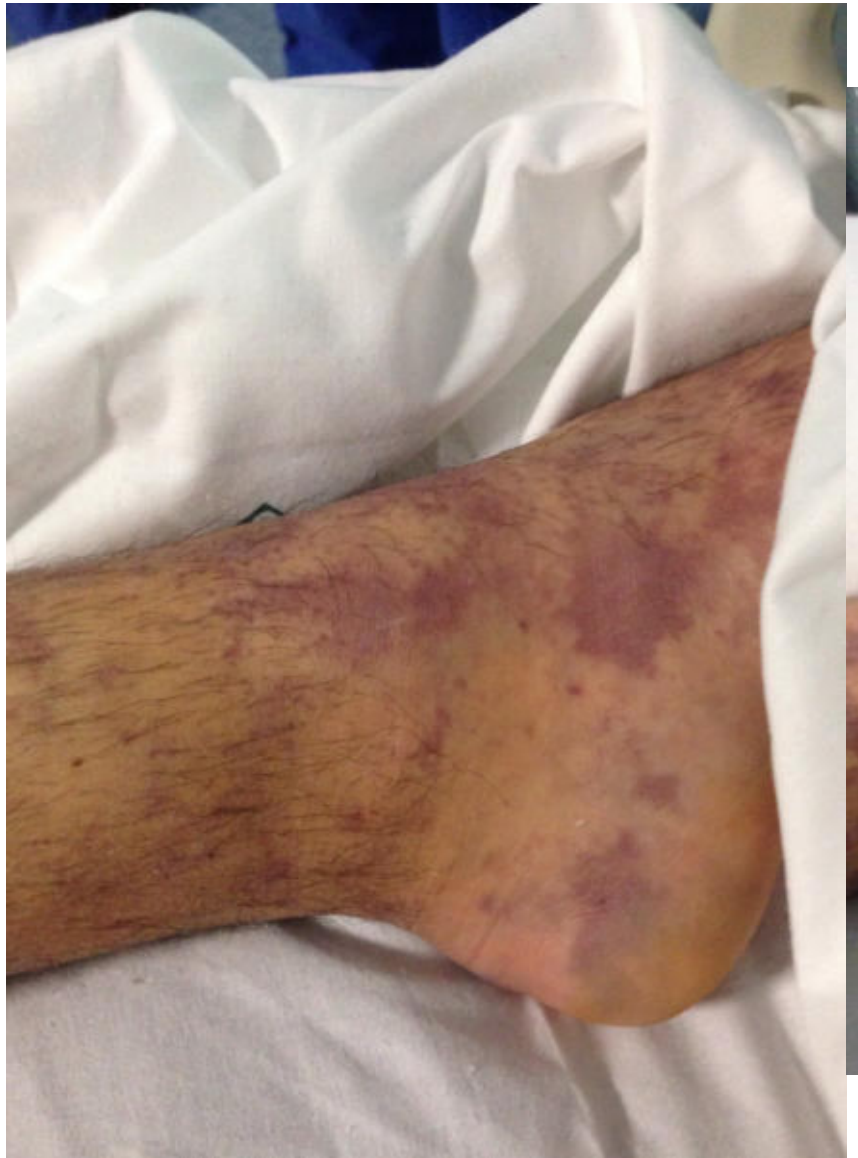


Figure 2. Immune dysregulation in sepsis. New insights into immune dysregulation have been gained using samples from deceased septic patients as well as from severely injured trauma patients. These studies demonstrate an enduring inflammatory state driven by dysfunctional innate and suppressed adaptive immunity that culminates in persistent organ injury and death of the patient. Although the initial inflammatory process, if unabated, contributes to organ failure and early mortality, this process is largely ameliorated by improvements in patient management protocols. However, considering that the vast majority of sepsis survivors are elderly with highly comorbid conditions, the short-term gains in survival have merely been pushed back by several months to a year. Although theories about the processes underlying this observation are numerous, the widespread consensus is that persistent derangements in innate and adaptive immune system cellular function are the main culprits driving long-term mortality.

Cortesia M. Girardis

Ore 7



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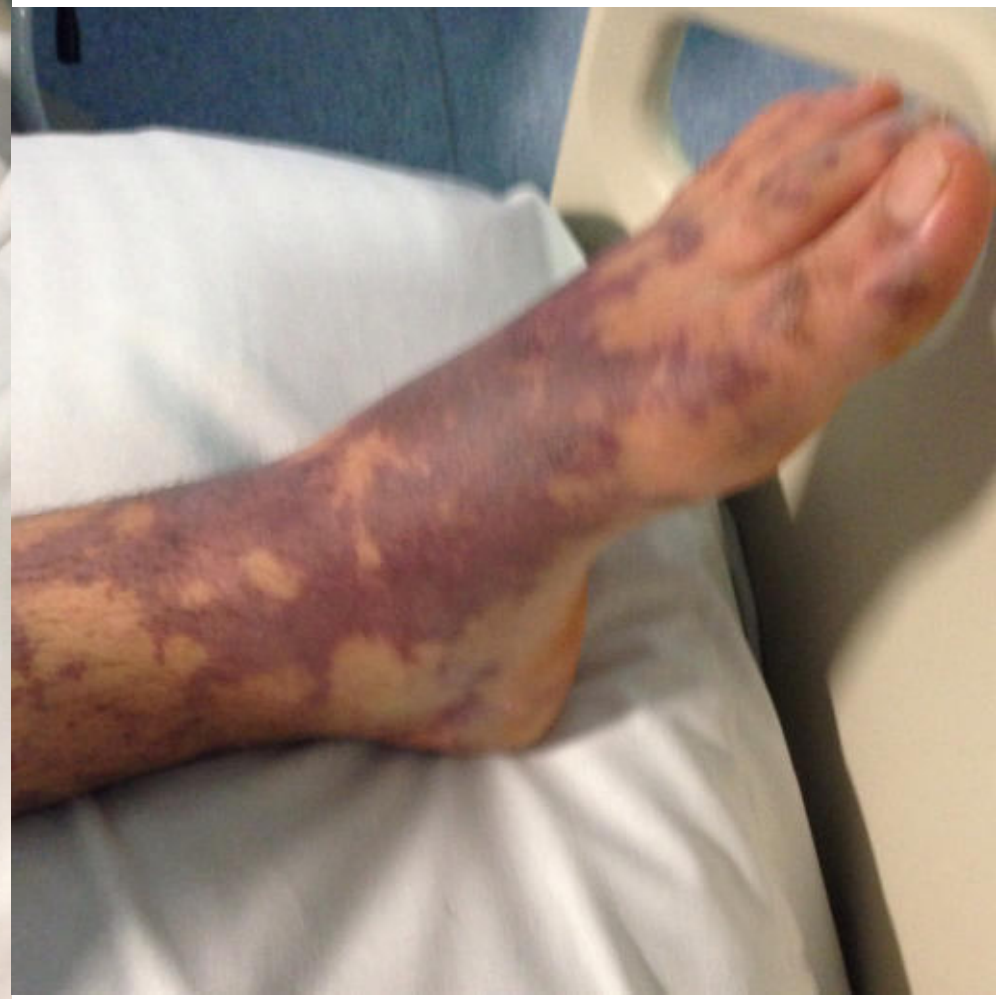
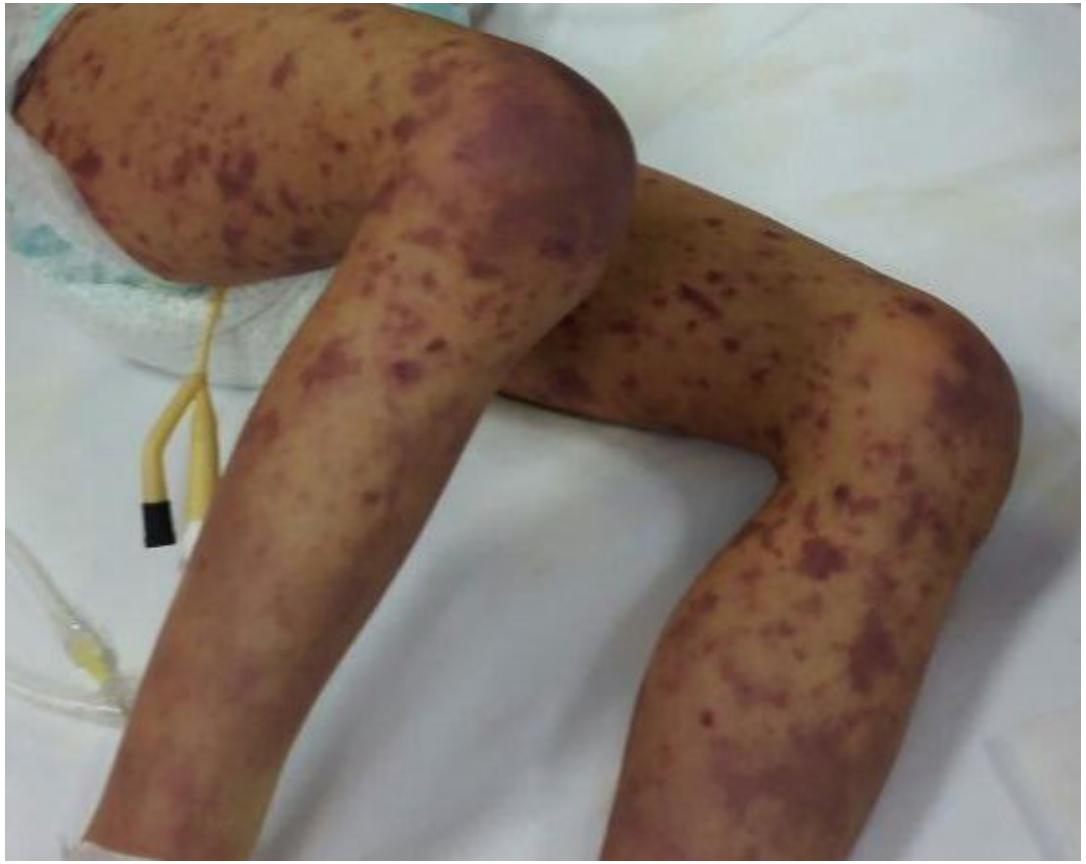


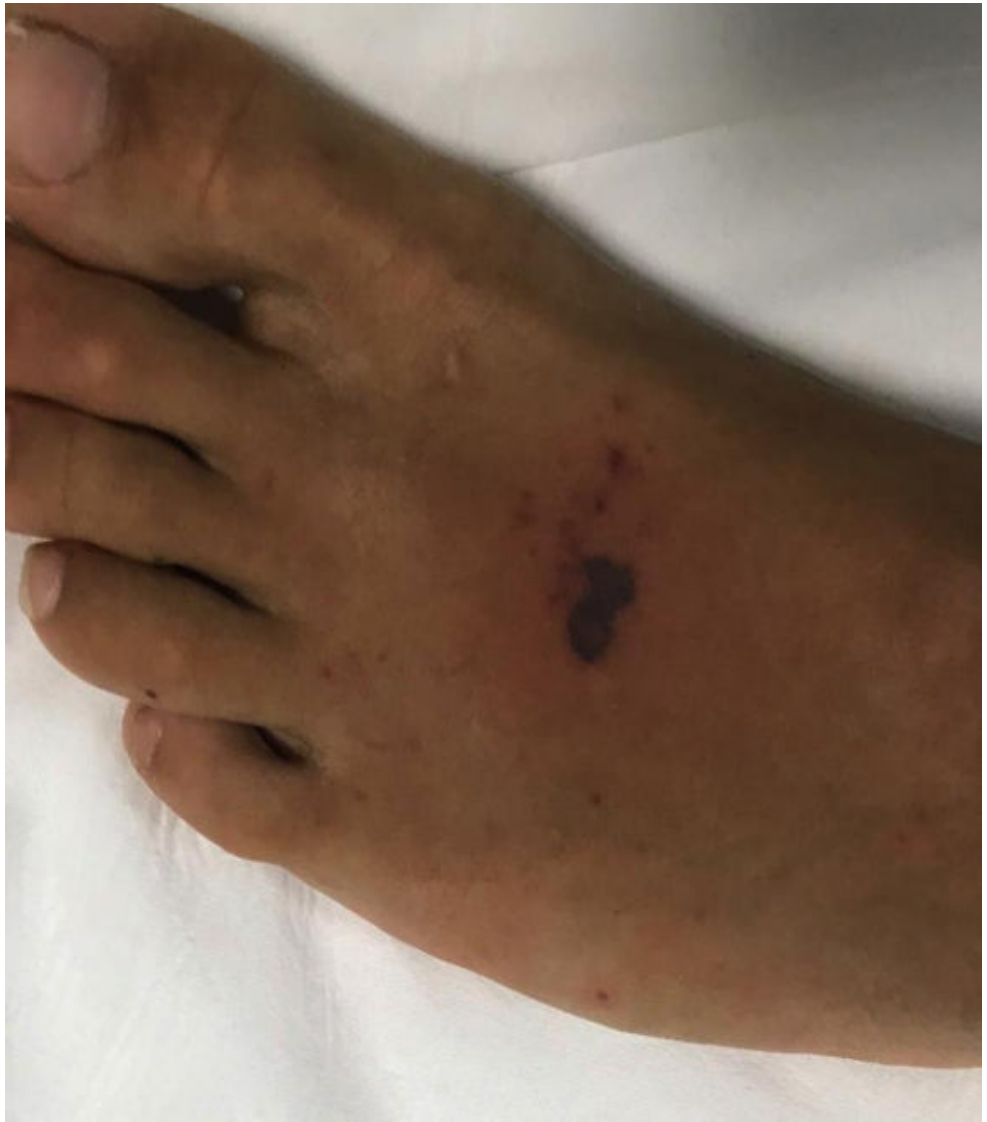
2018: *N. meningitidis* gruppo C, ST Type 11, ceppo toscano, bambino di 5 anni, in arresto dopo cortisone ed antibiotico: non vaccinato, Endotossina 1, PCT 80



N. meningitidis gruppo Y

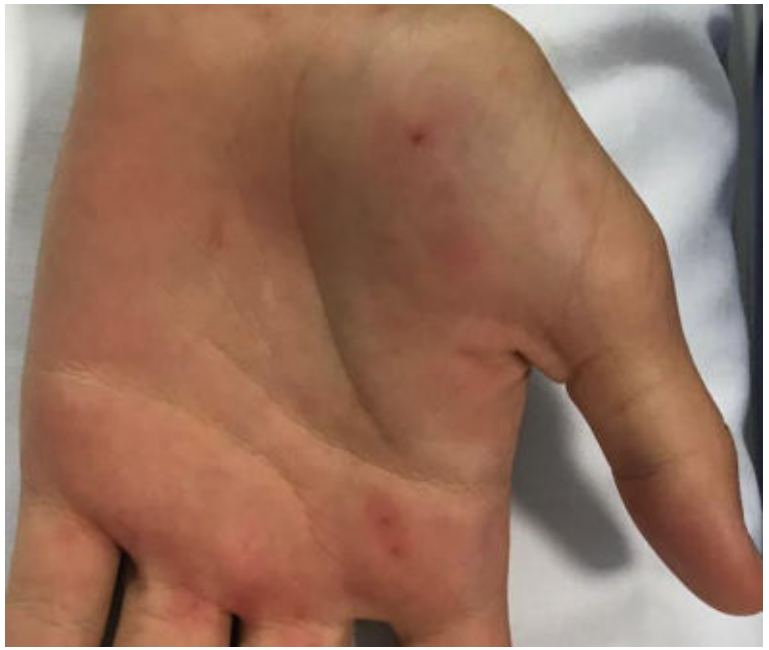
- Paziente di 13 anni arriva in coma all'Ospedale Cotugno: rigidità nucale e febbre
- Nessuna petecchia
- Ricovero in UTI: si programma PL
- Arriva anche il fratello di 11 anni: febbre, nessun segno neurologico
- EO: negativo, torace, addome, cuore, non rigidità nucale: non si tolgono le calze

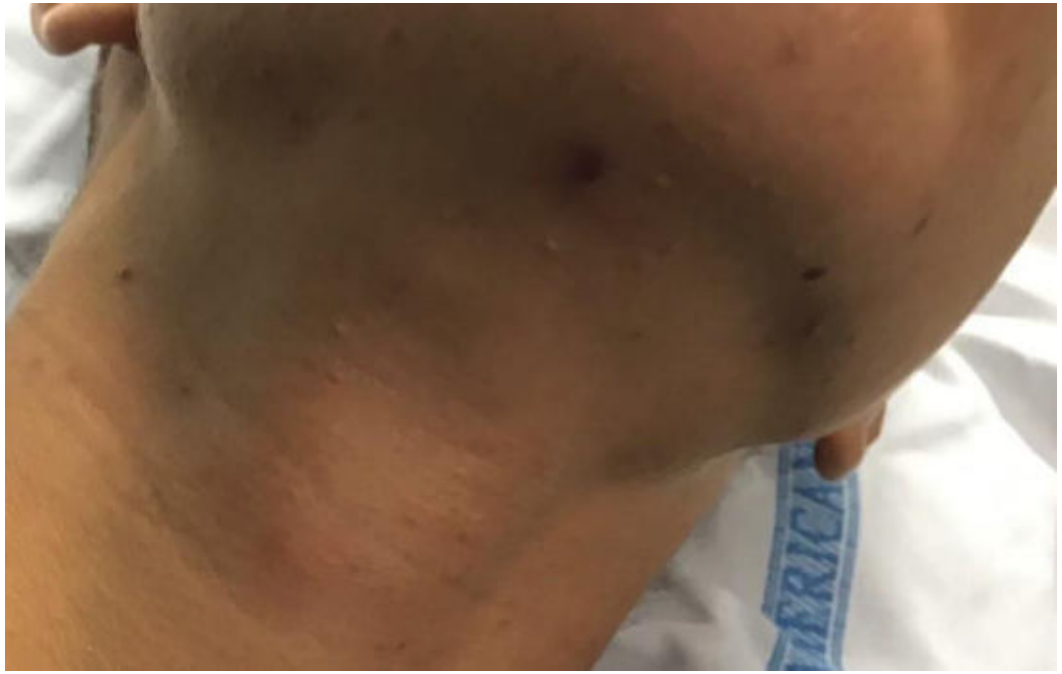
Sepsi meningococcica senza meningite: non trattata 80% mortalità

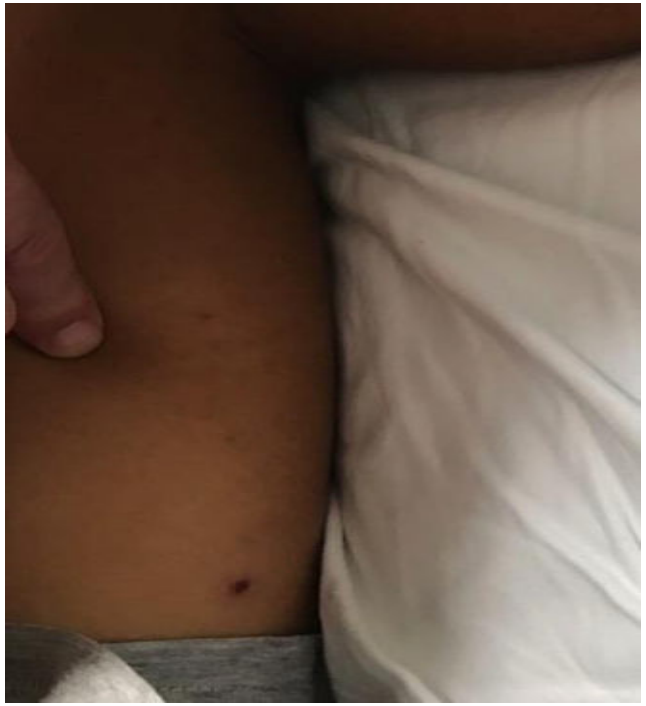


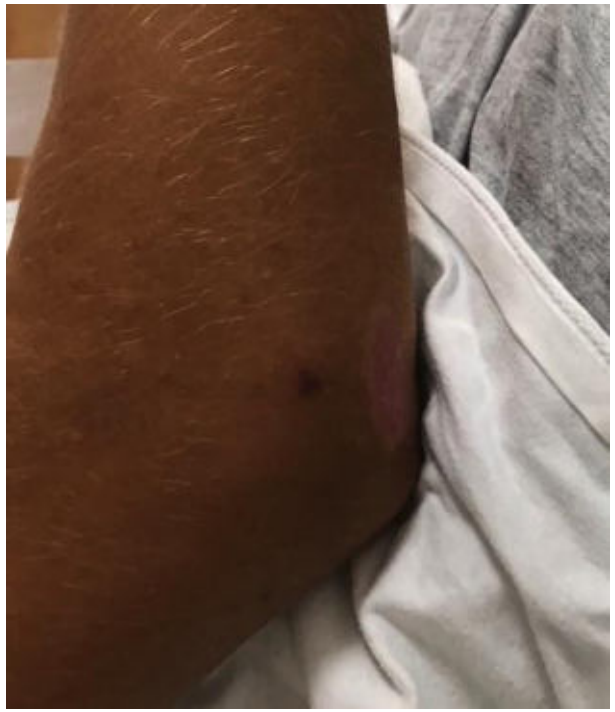
N. meningitidis gruppo Y

- Dopo due ore, il paziente rientra con numerose petecchie
- Sia lui che il fratello hanno *N. meningitidis* gruppo Y , lui isolato solo da sangue, il fratello solo da liquor









Med Intensiva. 2014;38(6):356–362

medicina *intensiva*

www.elsevier.es/medintensiva

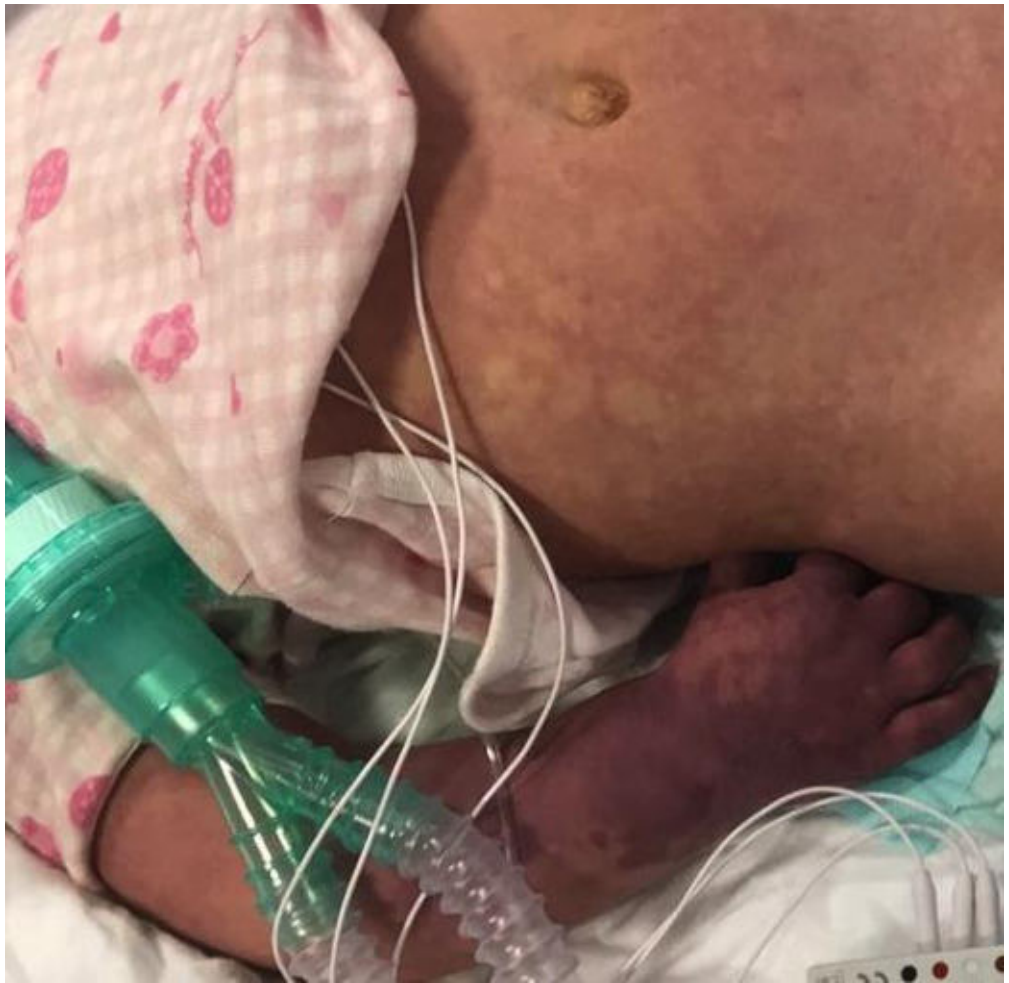
ORIGINAL

TLR2–TLR4/CD14 polymorphisms and predisposition to severe invasive infections by *Neisseria meningitidis* and *Streptococcus pneumoniae*☆

J.J. Tellería-Orriols[b], A. García-Salido[a,*], D. Varillas[b], A. Serrano-González[a], J. Casado-Flores[a]

Conclusions: Genetical variations in the innate immune system by polymorphisms in the TLR2 and CD14, could be related with an increases susceptibility to severe invasive infections by *S. pneumoniae* and *N. meningitidis*.

2018: *N. meningitidis* gruppo W, st type 11, bambina di 12 mesi, deceduta dopo cortisone ed antibiotico: endotossina 1,2, PCT 100



Meningococchi Campania 2018

- **1)** 5 anni**, deceduto** sierotipo C St type 11, P1.5,-1.,10-8:F3-6,
- **2)** 23 anni, vivo C, cc10127
- **3)** 1 anno, **deceduta** W, st 11, P1.5, 2:F1-1
- **4**, 64 anni, **deceduta**, Y, st 23,P1.5-2, 10-2:F2-F3
- **5)** 74 anni**,** viva, Y, st 23,
- **6)**, 21 anni, viva, amputata, C, St type 11, P1.5,-1.,10-8:F3-6
- **7)** 28 anni, **deceduto**, W, st 11, P1.5, 2:F1-1
- 8) 5 anni , B vivo
- 9) 8 Mesi, **deceduta**, C, St 11, P1.5,-1.,10-8:F3-6
- 10) 18 mesi sopravvissuto, sierogruppo B,, vivo.
- 11) 16 anni, **deceduto**, sierogruppo C, St 11, P1.5,-1.,10-8:F3-6,
- 12) 51 anni, sopravvissuta, Siero Y.
- 13) 62 anni, sopravvissuta, siero Y.
- 14) 44 anni, deceduto, B
- 15) 4 mesi, vivo, B
- 16) 6 anni, viva, Y
- 17) nocera, vivo, non gruppato
- 18) 23 anni, deceduto, C
- 19) 2 anni, deceduto, B

Modello Ischia

- Prophylaxis of close contact
- Secondary Action
- Information to the population
- Screening of the all close contact Ring Vaccination
- 7.000 vaccination in Ischia Island

Assemblea con la popolazione a Serrara Fontana

Azioni di contrasto

- Ring vaccination of close contact
- Efforts to increase the rate of vaccination in Campania Region

Intensive Care Med (2018) 44:1502–1511
https://doi.org/10.1007/s00134-018-5341-3

ORIGINAL

Clinical spectrum and short-term outcome of adult patients with purpura fulminans: a French multicenter retrospective cohort study

Damien Contou[1,2*], Romain Sonneville[3], Florence Canoui-Poitrine[4,5], Gwenhaël Colin[6], Rémi Coudroy[7,8], Frédéric Pène[9], Jean-Marc Tadié[10], Martin Cour[11], Gaëtan Béduneau[12], Antoine Marchalot[13], Laurent Guérin[14], Sébastien Jochmans[15], Stephan Ehrmann[16], Nicolas Terzi[17], Sébastien Préau[18], François Barbier[19], Guillaume Schnell[20], Damien Roux[21], Olivier Leroy[22], Claire Pichereau[23], Elodie Gélisse[24], Lara Zafrani[25], Richard Layese[4], Christian Brun-Buisson[1], Armand Mekontso Dessap[1] and Nicolas de Prost[1] for the Hopeful Study Group

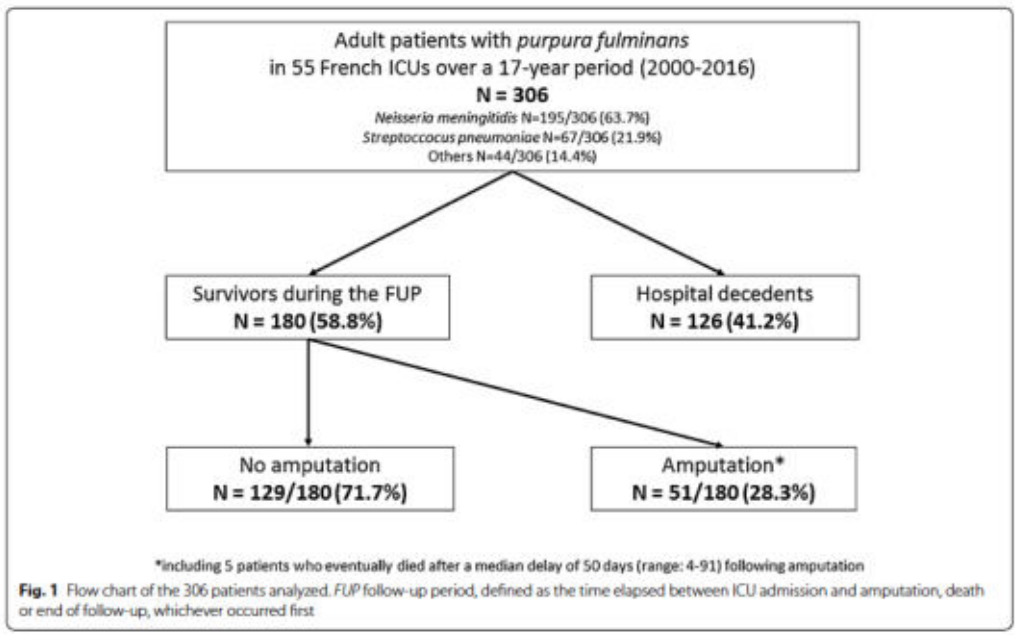


Fig. 1 Flow chart of the 306 patients analyzed. *FUP* follow-up period, defined as the time elapsed between ICU admission and amputation, death or end of follow-up, whichever occurred first

Intensive Care Med (2018) 44:1502–1517
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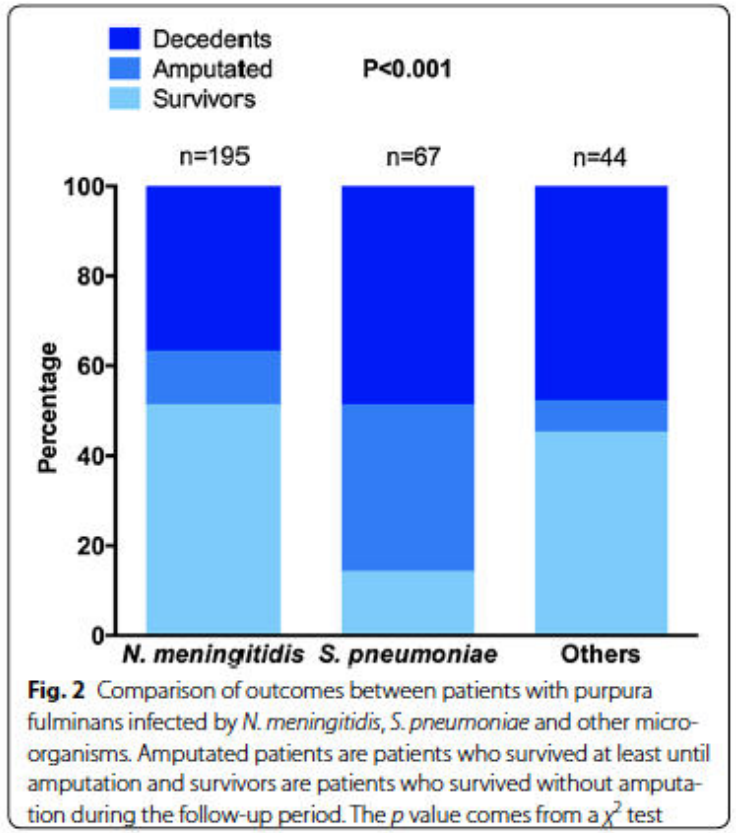

Fig. 2 Comparison of outcomes between patients with purpura fulminans infected by *N. meningitidis*, *S. pneumoniae* and other micro-organisms. Amputated patients are patients who survived at least until amputation and survivors are patients who survived without amputation during the follow-up period. The *p* value comes from a χ^2 test

Table 3 Multivariable Cox model for hospital death (censored at day 30) after multiple imputations and adjustment for center size and year of admission ($n = 301$)

	Hospital death ($n = 301$, number of events = 114)	
	HR (95% CI)	*p*
SAPS II	1.03 (1.02–1.04)	< 0.001
Neck stiffness	0.51 (0.28–0.92)	0.026
Leukocytes count, 10^3 mm^{-3}	0.83 (0.69–0.99)	0.034
Arterial lactate, mmol/L[a]	2.71 (1.68–4.38)	< 0.001
Platelets count, 10^3.mm^{-3} [a]	0.77 (0.60–0.91)	0.007
Center size ≥ 4 patients	0.45 (0.27–0.97)	0.028
Year of admission		0.52
2000–2004	1.00	
2005–2008	1.11 (0.64–1.94)	0.71
2009–2012	0.75 (0.43–1.32)	0.32
2013–2016	0.97 (0.55–1.72)	0.93

HR adjusted hazard-ratio, *CI* confidence interval

[a] Log-transformed variables and expressed for one unit of the log

frontiers in Medicine

ORIGINAL RESEARCH
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D-Dimer as Biomarker for Early Prediction of Clinical Outcomes in Patients With Severe Invasive Infections Due to *Streptococcus Pneumoniae* and *Neisseria Meningitidis*

Simone Meini[1], Emanuela Sozio[2], Giacomo Bertolino[3], Francesco Sbrana[4], Andrea Ripoli[4], Carlo Pallotto[5,6], Bruno Viaggi[7], Roberto Andreini[1], Vittorio Attanasio[8], Carolina Rescigno[8], Luigi Atripaldi[9], Silvia Leonardi[9], Mariano Bernardo[9] and Carlo Tascini[2,8]*

D-dimer values. In conclusion, D-dimer is rapid to be obtained, at low cost and available everywhere, and can help stratify the risk of in-hospital mortality and complications in patients with invasive infections due to *N. meningitidis*: D-dimer <500 ng/mL excludes any further complications, and a cut-off of 7,000 ng/mL seems able to predict a significantly increased mortality risk from much <10% to over 25%.

We focused on the role of D-dimer assessed within 24 h after admission in predicting clinical outcomes in a cohort of 270 patients hospitalized in a 79 months period for meningitis and/or bloodstream infections due to *Streptococcus pneumoniae* (n = 162) or *Neisseria meningitidis* (n = 108). Comparisons were performed with

frontiers in Medicine

ORIGINAL RESEARCH

D-Dimer as Biomarker for Early Prediction of Clinical Outcomes in Patients With Severe Invasive Infections Due to *Streptococcus Pneumoniae* and *Neisseria Meningitidis*

Simone Meini[1*], Emanuela Sozio[2], Giacomo Bertolino[1], Francesco Sbrana[1], Andrea Ripoli[1], Carlo Pallotto[1,2], Bruno Viaggi[1], Roberto Andreini[1], Vittorio Attanasio[3], Carolina Rescigno[3], Luigi Atripaldi[3], Silvia Leonardi[3], Mariano Bernardo[3] and Carlo Tascini[1,2]

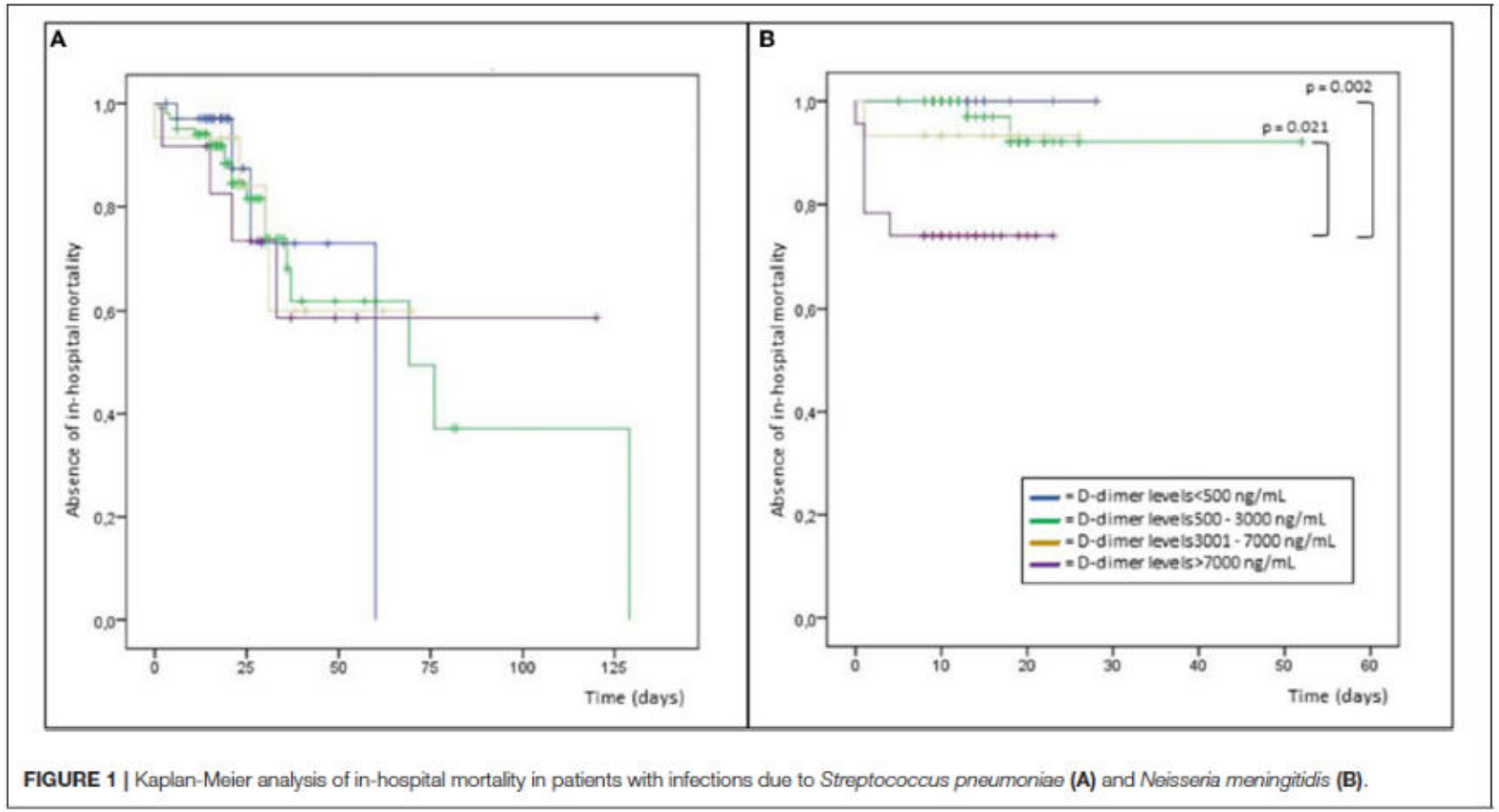
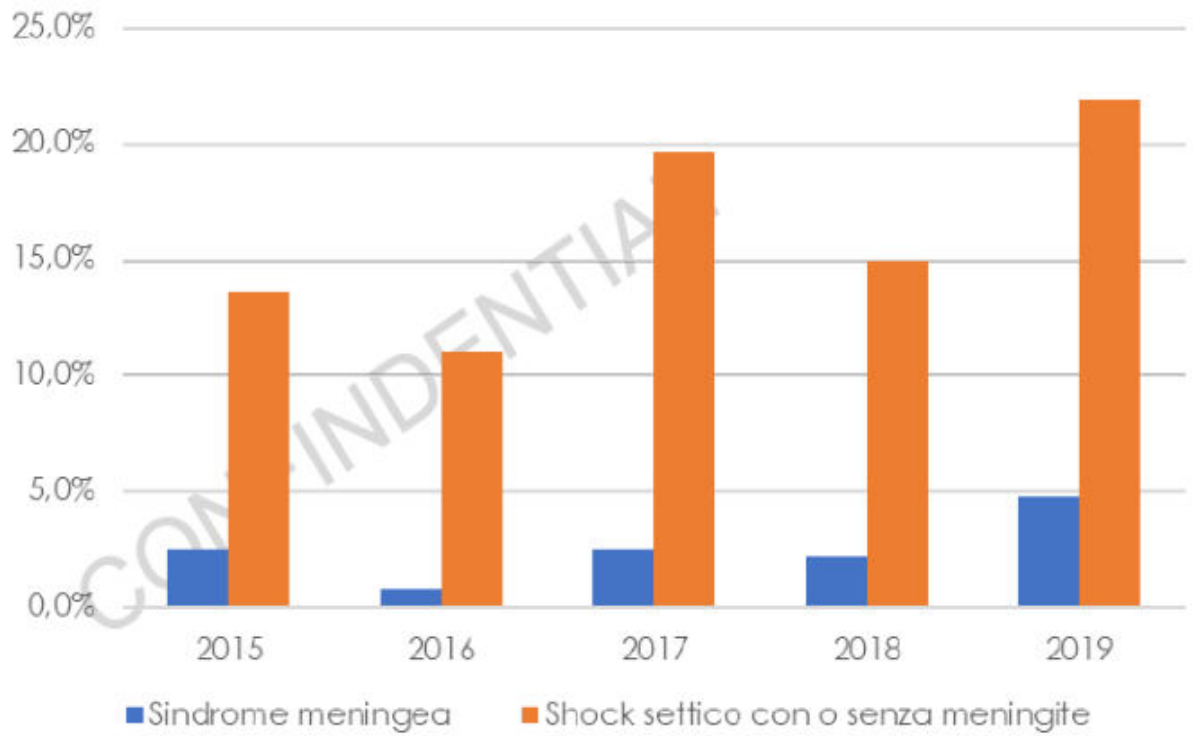


FIGURE 1 | Kaplan-Meier analysis of in-hospital mortality in patients with infections due to *Streptococcus pneumoniae* **(A)** and *Neisseria meningitidis* **(B)**.

Analisi delle SDO nazionali dal 2015 al 2019: mortalità dei casi di meningococco (CREA confidential)



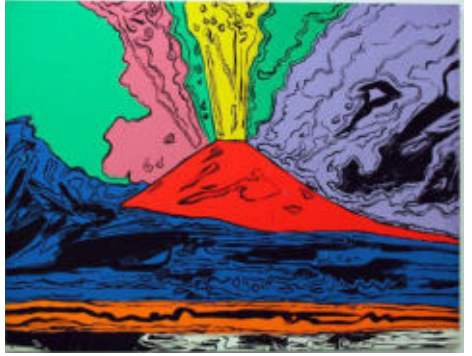
The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

CURRENT CONCEPTS

Community-Acquired Bacterial Meningitis in Adults

Diederik van de Beek, M.D., Ph.D., Jan de Gans, M.D., Ph.D.,
Allan R. Tunkel, M.D., Ph.D., and Eelco F.M. Wijdicks, M.D., Ph.D.



- Purulent meningitis: dexamethasone NNT 1:10
- Mortality from 15 to 7%
- Glasgow score 8-11
- Pneumococcus: dexamethasone NNT 1:4
- Mortality from 34% to 14%
- **Steroid should be administered within 4 hours from antibiotic administration**

Steroid

Grade A	Empiric treatment with dexamethasone is strongly recommended for all adults (10 mg qid for 4 days) and children (0.15 mg/kg qid for 4 days) with acute bacterial meningitis in the setting of high-income countries.
Grade A	Treatment with dexamethasone is strongly recommended to be initiated with the first dose of antibiotic treatment.
Grade C	If intravenous antibiotic treatment has already been started, dexamethasone can still be administered up to 4 hours after start of the first dose of intravenous antibiotics.
Grade B	It is recommended to stop dexamethasone if the patient is discovered not to have bacterial meningitis or if the bacterium causing the meningitis is a species other than *H. influenzae* or *S. pneumoniae,* although some experts advise that adjunctive treatment should be continued irrespective of the causative bacterium.

Adjunctive dexamethasone in adults with meningococcal meningitis

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Matthijs C. Brouwer, MD, PhD*
Arie van der Ende, PhD
Diederik van de Beek, MD, PhD

Dexamethasone, 10 mg IV, given every 6 hours for 4 days was started before or with the first dose of parenteral antibiotics in 78 of 96 episodes (81%). In 6 patients (6%), dexamethasone was discontinued after cultures grew meningococci. Dexamethasone was prescribed in 35 of 39 patients (90%) with a rash on admission. Adjunctive dexamethasone was administered in 43 episodes (17%) in the 1998–2002 cohort. Twelve of these patients were included in the European dexamethasone in adulthood bacterial meningitis study and received dexamethasone 10 mg IV, given every 6 hours for 4 days, started before or with first dose of parenteral antibiotics; dexamethasone was initiated after clinical deterioration in all other episodes.[4,13]

Steroid use in non-pneumococcal and non-Haemophilus bacterial meningitis

Lancet 2022 Feb 19;399(10326):717-718.

To conclude, dexamethasone should be initiated with the first dose of antibiotics in all patients with community-acquired bacterial meningitis beyond the neonatal age. On the basis of available evidence, we advise to continue dexamethasone treatment in this patient group for 4 days regardless of microbial cause, except in patients with *Listeria monocytogenes*.

We declare no competing interests.

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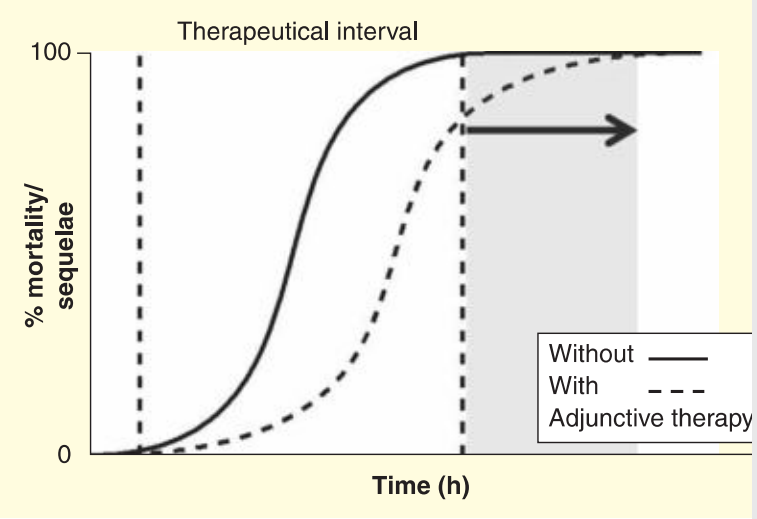


Figure 2. Relation of the interval between entry of bacteria into the CNS and start of antibiotic treatment versus mortality. Our experience in experimental mice suggests that this relation can be described by a sigmoid curve with a steep slope close to the interval where 50% mortality occurs (black solid line). Adjuvant therapies or an improvement of antibiotic therapy (e.g., non-bacteriolytic bactericidal antibiotics) can only be effective in a narrow window (the therapeutic interval) by shifting the sigmoid curve to the right without or with alteration of its slope (black broken line). The black arrow and the grey area indicate the broadening of the therapeutic window by an improvement of therapy. When antibiotic therapy is started very early, all patients will survive. When antibiotic treatment is started after the point of no return, the infected organism will die irrespective of the therapy chosen. The relations of the interval between entry of bacteria into the CNS and start of antibiotic treatment versus other outcome parameters (e.g., long-term neurological sequelae) probably also follow sigmoid curves. The slopes, however, are not necessarily identical. Here, effective adjuvant therapies or an improved antibiotic therapy also shift the curve to the right.

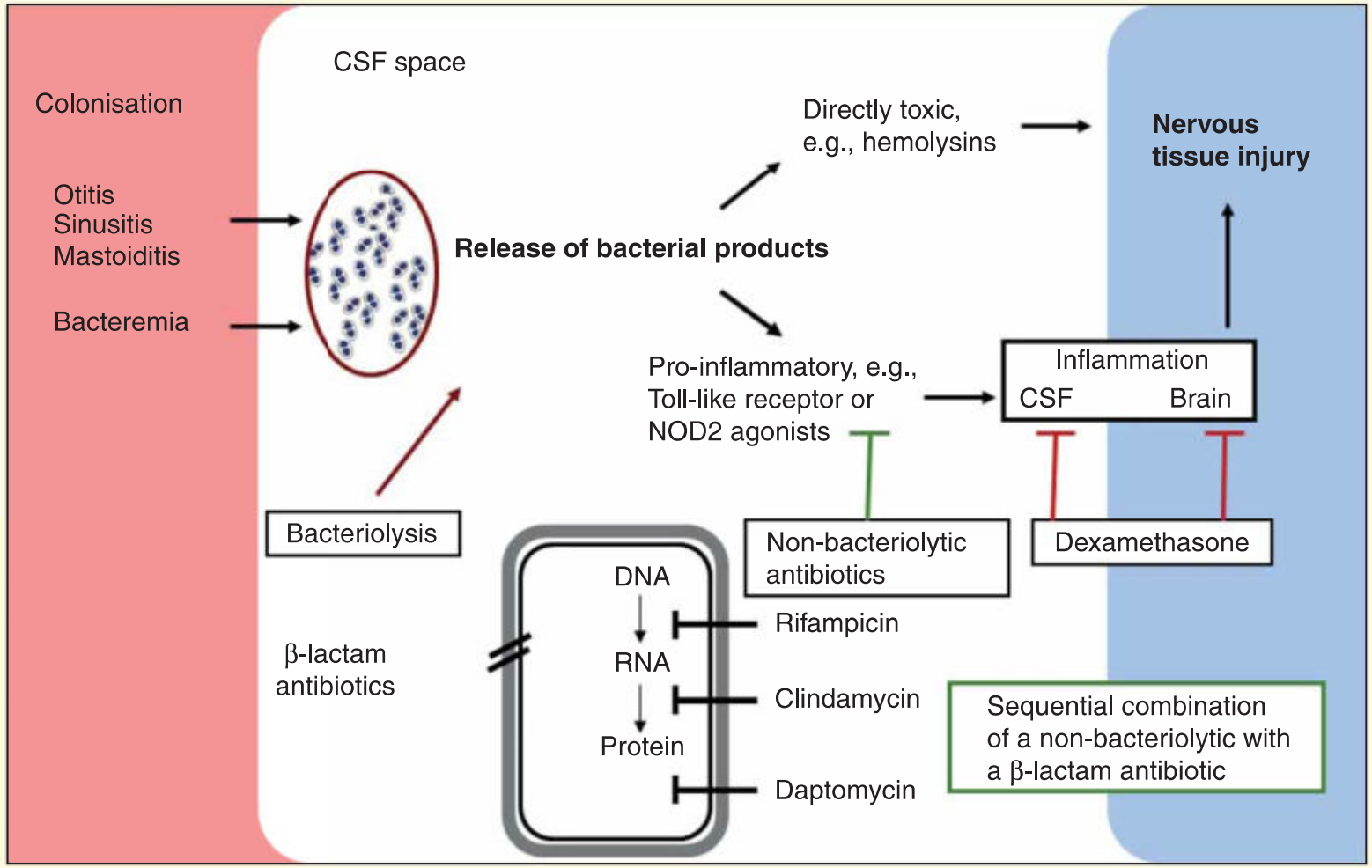
Expert Review of Anti-infective Therapy

ISSN: 1478-7210 (Print) 1744-8336 (Online) Journal homepage: http://www.tandfonline.com/loi/ierz20

Bacterial meningitis: an update of new treatment options

Roland Nau, Marija Djukic, Annette Spreer, Sandra Ribes & Helmut Eiffert

Quick and dirty versus killing bacteria softly



Bretonnière et al. Critical Care (2015) 19:303
DOI 10.1186/s13054-015-1021-7

CRITICAL CARE

RESEARCH Open Access

Rifampin use in acute community-acquired meningitis in intensive care units: the French retrospective cohort ACAM-ICU study

Cédric Bretonnière[1,2*], Mathieu Jozwiak[1,3], Christophe Girault[4,5], Pascal Beuret[6], Jean-Louis Trouillet[7], Nadia Anguel[3], Jocelyne Caillon[2,8], Gilles Potel[2,9], Daniel Villers[1], David Boutoille[2,10] and Christophe Guitton[1]

Table 2 Correlation between ICU mortality and rifampin treatment in critically ill patients admitted with bacterial meningitis

Rifampin use	Non-survivors		Survivors		*p* Value
Entire population	n=23		n=134		
Rifampin during hospitalization	2/23	8.7 %	30/134	22.4 %	NS
Rifampin during first 48 h of hospitalization	1/23	4.3 %	23/134	17.2 %	NS
Rifampin during first 24 h of hospitalization	0/23	0.0 %	19/134	14.2 %	0.078
Streptococcus pneumoniae meningitis	n=18		n=58		
Rifampin during hospitalization	2/18	11.1 %	18/58	31.0 %	NS
Rifampin during first 48 h of hospitalization	1/18	5.6 %	15/58	25.9 %	0.097
Rifampin during first 24 h of hospitalization	0/18	0.0 %	13/58	22.4 %	**0.031**

NS not significant
Data are proportions of patients. They were compared with Fisher's exact test
p Values <0.1 are detailed. *p* Values <0.05 were considered significant (bold)

Journal of Infection (2016) xx, 1–4

LETTER TO THE EDITOR

Clinical presentation and outcome of twenty cases of Invasive Meningococcal Disease due to Serogroup C – Clonal complex 11 in the Florence province, Italy, 2015–2016

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Table 1 Demographical and clinical characteris ical presentation, from January 2015 to June 20

Characteristics (n available data/total)[a]	All patients (20 cases)	Septic shock with *Purpura fulminans* (9 cases)
Male sex (%, 20/20)	55%	66%
Years (mean, 20/20)	40 (13–83)	39 (13–83)
Main presenting symptoms (20/20)	Fever (Mean 38.7 °C) and petechiae (different degrees) always present	Confluent petechiae, fever
Hours between symptoms onset and referral to ED (mean, 13/20)	24	22
MEWS score at presentation to ED (mean, 13/20)	1,8	1,5
Selected bio-chemistry parameters		
White blood cells (mean, 16/20)	$13,1 \times 10^3$	$6,3 \times 10^3$
Platelets (mean, 16/20)	119×10^3	68×10^3
C-reactive protein (mean, 14/20)	18	11
Procalcitonin (mean, 10/20)	80	127
Cerebrospinal fluid		
Proteins (mean, 13/13)		30 (20–40)[b]
Cells (mean, 13/13)		5 (2–8)[b]
Glucose (mean, 13/13)		55 (50–65)[b]
Need for intensive care (IC) (20/20)	17/20	9/9
Mean length of stay in IC (days)		Not calculable[c]
Letality (20/20)	7/20; 35%	7/9; 77%

Vaccine 36 (2018) 5962–5966

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Invasive Meningococcal Disease due to group C N. meningitidis ST11 (cc11): The Tuscany cluster 2015–2016

Francesco Menichetti [a,⇑], Simona Fortunato [a], Andrea Ricci [a], Francesca Salani [a], Andrea Ripoli [b], Carlo Tascini [c], Francesco Maria Fusco [d], Jessica Mencarini [e], Alessandro Bartoloni [e], Massimo Di Pietro [f]

Table 2
Patient outcome according to demographic, clinical and management variables.

	Recovered (n = 38)	Sequelae or death (n = 15)	P value univariate analysis	OR[b]
Males	17 (45%)	9 (60%)	0.486	–
Mean age (range)	33.9 (3–70)	35.5 (17–75)	0.799	**1.003**
Previous Vaccination[a]	9 (24%)	2 (13%)	0.645	–
Meningitis	6 (16%)	2 (13%)	1	–
Meningitidis + meningococcemia	16 (42%)	7 (47%)	1	–
Meningococcemia	16 (42%)	6 (40%)	1	–
Septic shock	**14 (37%)**	**12 (80%)**	**0.011**	**1.211**
Multi-organ failure	11 (29%)	8 (53%)	0.177	–
Disseminate intravascular coagulophaty	**7 (18%)**	**9 (60%)**	**0.008**	**–**
Purpura fulminans	**6 (16%)**	**9 (60%)**	**0.004**	**6.641**
Adequate Antibiotic therapy	38 (100%)	15 (100%)	**1**	**–**
Steroid treatment	28 (74%)	11 (74%)	1	–
Pentaglobin®	8 (21%)	2 (13%)	0.797	–
ICU	25 (66%)	14 (93%)	0.089	–
Tertiary-care Universitary Hospital	**13 (34%)**	**0 (0%)**	**0.024**	**0.111**

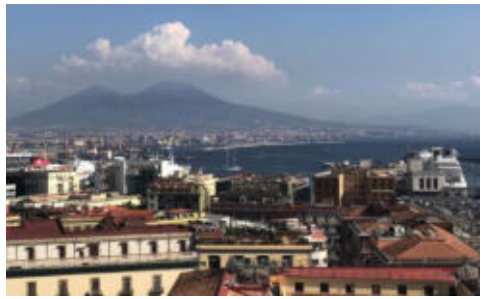
[a] Previous receipt of a serogroup C-containing meningococcal conjugate vaccine.
[b] OR were calculated with a multivariate analysis on a total of 53 patients with the availability of all the listed variables.

Intensive Care Med
DOI 10.1007/s00134-017-4957-z

LETTER

Potential role of IgM-enriched immunoglobulin as adjuvant treatment for invasive meningococcal disease

Carlo Tascini[1], Fiorentino Fraganza[2], Francesca Salani[3], Emanuela Sozio[4], Marco Rossi[1], Francesco Sbrana[5], Novella Carannante[1], Maria Daniela Chiesa[2], Andrea Ripoli[5], Giacomo Bertolino[6], Massimo Di Pietro[7], Alessandro Bartoloni[8,9] and Francesco Menichetti[3*], on behalf of GISA/SIMIT Meningitis Study Group



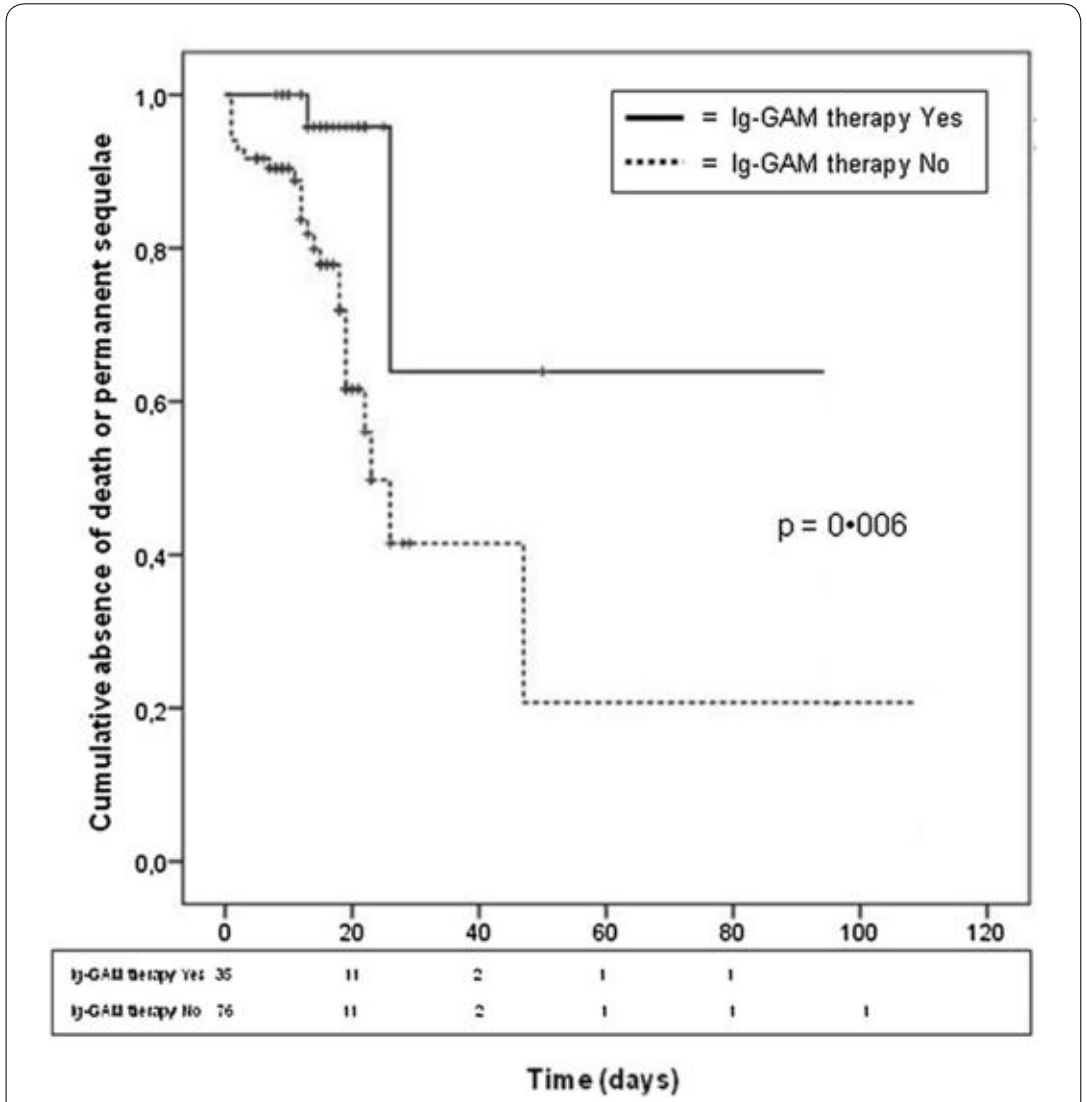
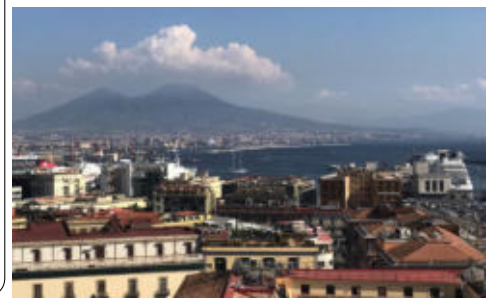


Fig. 1 Kaplan–Meier analysis of aggregated data on death and permanent sequelae in patients treated or not with Ig-GAM



frontiers in Cellular and Infection Microbiology

REVIEW
published: 23 November 2020
doi: 10.3389/fcimb.2020.592017

The Use of Adjunctive Steroids in Central Nervous Infections

Shalini Gundamraj[1] *and Rodrigo Hasbun*[2*]

Listeria monocytogenes

L. monocytogenes most commonly occurs in neonates, adults above the age of 50 years and in patients with cellular immunodeficiency. In the Swedish study, adjunctive steroids showed a trend towards worse outcomes in patients with Listeria meningitis (48.5% vs. 40.0%) (Glimåker et al., 2016) (see **Table 1**). A large prospective study in France of 818 cases of Listeriosis documented a higher mortality in patients with neurolisteriosis when given adjunctive dexamethasone (OR 4·58 [1·50–13·98], p=0·008) (Charlier et al., 2017). Adjunctive dexamethasone should be discontinued if meningitis is found not to be caused by *S. pneumoniae*, especially if it is caused by *L. monocytogenes* (Hasbun, 2019).

Glimåker et al., 2016	*Listeria monocytogenes*	77	Adjunctive steroid therapy showed worsened outcome trend compared to non-steroid-treated patients (48.5% vs. 40.0%).	Observational study
Charlier et al., 2017	*Listeria monocytogenes*	818	Higher mortality in patients when given adjunctive dexamethasone (OR 4·58 [1·50-13·98], p=0·008).	Observational study

Se liquor molto infiammato? Desametasone 4 mg ogni 12 ore?

K. pneumoniae: ceppo ipervirulento

- Prima causa di meningite in Taiwan
- Si associa ad insufficienza epatica, diabete
- Forme ascessuali del fegato ed altri organi
- Mortalità dal 30 al 90%
- Ceppi ipervirulenti OXA-48 segnalati in Irlanda dall'ECDC

Special Article

87

Adult *Klebsiella pneumoniae* Meningitis in Taiwan: An Overview

Wen-Neng Chang[1], Chi-Ren Huang[1], Cheng-Hsien Lu[1], Chun-Chih Chien[2]

Abstract-

Klebsiella (K.) pneumoniae infections, including adult bacterial meningitis (ABM), are a distinct syndrome in Taiwan, which may consist of diabetes mellitus and multiple septic metastatic lesions such as liver abscess, endophthalmitis, and focal suppuration of other internal organs. In this review article, the authors will discuss the protean clinical manifestations and the complexity of the clinical course of this specific central nervous system infectious disease in Taiwan. The clinical and laboratory data of 49 *K. pneumoniae* ABM cases diagnosed at Chang Gung Memorial Hospital-Kaohsiung, collected over a period of 11 years (2000-2010), were included for analysis. This review may help clinical physicians, especially first-line, primary-care physicians, to have a better understanding of this critical CNS infection.

Key words: adult bacterial meningitis; diabetes mellitus; *Klebsiella pneumoniae*; multiple metastatic septic abscesses; prognostic factors

Acta Neurol Taiwan 2012;21:87-96

TABLE 1 | Main characteristic of cKP, hvKP, and MDR-hvKP.

Characteristics	Classical *K. pneumoniae* (cKP)	Hypervirulent *K. pneumoniae* (hvKP)	Multidrug-resistant hvKP (MDR-hvKP)	References
Infections	**Acquisition:** nosocomial **Host:** immunocompromised patients **Geographic region:** the whole world **Infectious sites:** urinary tract infections, pneumonia, bloodstream infections; usually polymicrobial at sites of infection **Metastasis:** uncommon	**Acquisition:** community **Host:** healthy adults **Geographic region:** Southeast Asia **Infectious sites:** pyogenic liver abscess, meningitis, endophthalmitis, necrotizing fasciitis; usually monomicrobial at sites of infection **Metastasis:** Common	**Acquisition:** nosocomial and community **Host:** usually immunocompromised patients **Geographic region:** Asia (especially China) **Infection sites:** pyogenic liver abscess, bloodstream infections, urinary tract infections	Harada et al., 2019; Russo and Mart, 2018; Liu C. et al., 2020; Tang et al., 2020
Phenotypes	Non-hypermucoviscosity and string <5 mm	Hypermucoviscosity and string ≥5 mm	Hypermucoviscosity or non-hypermucoviscosity	Russo et al., 2018
Common serotypes	K1–K79	K1, K2, K5, K16, K20, K54, K57, KN1	K1, K2, K16, K20, K54, K62, K64, K47	Pan et al., 2008, 2015; Yang et al., 2021
Siderophores	Enterobactin, yersiniabactin	Enterobactin, yersiniabactin, salmochelin, and aerobactin	Enterobactin, yersiniabactin, salmochelin, and aerobactin	Russo et al., 2015; Lam et al., 2018b; Choby et al., 2020

S. agalactiae

- Neonato, trasmissione dalla madre al momento del parto
- Adulti, spesso con endocardite (vegetazioni giganti) ed embolismo al SNC con ictus e meningite
- ProADM nel liquor come marcatore di danno d'organo (caso mortale di *S. agalactiae* pro ADM nel liquor 12 rispetto a due del sangue)

S. pyogenes

- Fino agli anni ‘30 del secolo scorso era la prima causa di otite, sostituito poi dallo pneumococco, quindi da vicinanza
- Meningiti drammatiche, formazione di tossine
- Uso di antibiotici che bloccano la sintesi proteica come nella fascite streptococcica!?
- Steroide si

JOURNAL OF CLINICAL MICROBIOLOGY, Nov. 2005, p. 5816–5818 Vol. 43, No. 11
0095-1137/05/$08.00+0 doi:10.1128/JCM.43.11.5816–5818.2005

Group A Streptococcal Meningitis in a Pediatric Patient following Cochlear Implantation: Report of the First Case and Review of the Literature

Géraldine Pettersen,[1] Philippe Ovetchkine,[2] and Bruce Tapiero[2]*
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Received 4 March 2005/Returned for modification 13 May 2005/Accepted 17 August 2005

The Food and Drug Administration published a public health warning on the association of bacterial meningitis and cochlear implants in June 2002. This article reports the first case of group A streptococcal (GAS) meningitis in a cochlear-implanted patient, followed by a review on cochlear implantation and GAS meningitis.

Clinical Infectious Diseases

IN THE LITERATURE

Stan Deresinski, Section Editor
?>

Stan Deresinski, Section Editor

DOES THE ABSENCE OF CEREBROSPINAL FLUID PLEOCYTOSIS RULE OUT THE PRESENCE OF BACTERIAL MENINGITIS?

In the combined cohorts, 26/51 (70.6%) of cases were due to *Streptococcus pneumoniae* and 6/51 (11.7%) to *Neisseria meningitidis*. A small number (1–3 each) of other pathogens were detected in the Netherlands experience: *Streptococcus agalactiae*, *Streptococcus pyogenes*, *Escherichia coli*, *Listeria monocytogenes*, and *Haemophilus influenzae*.

- Due coorti: una Olandese ed una Danese
- Entrambi 2% con liquor normale, cellule, proteine e glicorrachia
- 25% con classica triade, 50% immunocompromessi
- 71% gram positivo
- Casi più gravi: mortalità 30%
- Tutti i casi danesi hanno sospeso la terapia antibiotica!!!!!

Infectious Diseases International Research Initiative (Idiri) GROUP STUDY

- The normal white blood cell (WBC) count in the cerebrospinal fluid (CSF) of adults is between 0 and 5 x10^6 cells/L
- ID-IRI CONDUCTED studies were investigated to **identify patients without CSF pleocytosis (WBC count of** 5 x10^6 **cells/l).**
- **The absence of pleocytosis was relatively infrequent but not rare in these CNS infections.**

Patients without CSF pleocytosis appeared to have a high rate of unfavorable outcomes, including sequelae and death. The examining clinician should not underestimate the presence of a CNS infection despite the lack of CSF pleocytosis for a patient with a suspicion of meningitis or encephalitis.

In particular, other clues related to the clinical presentation or abnormalities in CSF analyses should be carefully considered as a whole, and microbiological clues pointing to a CNS infection should be pursued when necessary.

Sequelae, *n* (%)[g]	(–)	6 (31%)	1 (20%)	12 (37%)	15 (39%)
Death, *n* (%)	Died	5 (26%)	(–)	3 (9%)	8 (21%)

Ref values

- Cells= <5 x10^6 cells/L
- Proteins=0.15-0.45 g/L (15-45 mg/dL)
- CSF/blood glucose=2/3

The lack of CSF pleocytosis can be seen more commonly in viral infections.

Only seven of the 96 patients (7.3%) had the classic meningitis triad.

Erdem et al Int J Infect Dis 2017

Conclusioni

- Meningite batterica: malattia relativamente rara
- Meningococco dipende dalle epidemie e dai sierogruppi
- Antibiotici battericidi non batteriolitici
- Uso dello steroide e terapie adiuvanti
- Specie più rare con decorsi drammatici