Microbiologist - Infectiologist relationship: synergy or antagonism ?

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Clinical impact of rapid in vitro susceptibility testing + bacterial identification

	A (n=273)		B (n=300)
Mean length of time to provision of -susceptibility data (hrs)	11.3		19.6
-identification	9.6		25.9
		(p<0.0005)	
Mean length of hospitalisation (d)	20.7	NS	20.1
Mean length of hospitalisation following index positive culture	14.7	NS	14.6
Mortality (%)	8.8		15.3
		(p<0.016)	
Mortality attributable to infection	19 (7%)		38 (12.7%)
		(p<0.023)	

Doern et al. *J Clin Microbiol*. (1994); 32:1757-62

Clinical impact of rapid in vitro susceptibility testing + bacterial identification

- Significantly fewer laboratory studies
  + imaging procedures
  + days of intubation
  + days in ICU/intermediate care

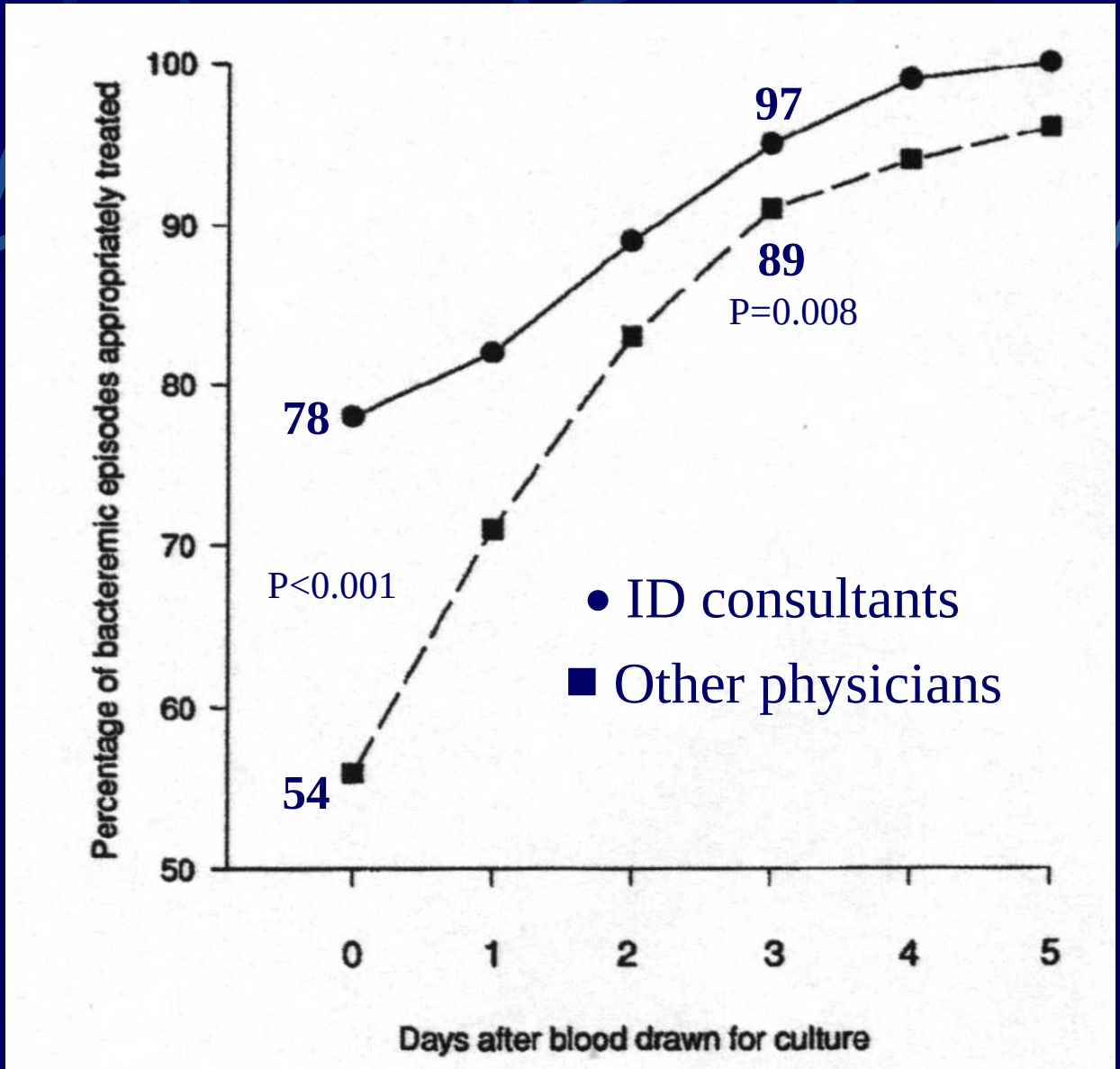
  in rapid test group.
- Significantly shorter lengths of elapsed time prior to alternations in antimicrobial therapy.
- Significantly lower costs for hospitalisation (4.194 $ savings per bacteremic patient).

Doern et al. *J Clin Microbiol*. (1994); 32:1757-62

Impact of ID specialists and microbiologic data on appropriateness of antimicrobial therapy (AT) for bacteremia

- 1 year prospective study of all (n=428) episodes of bacteremia (at least 2 pos. blood cultures for same micro-organism)
- Assessment of impact of therapy chosen by infectious diseases (ID) specialists on quality of treatment and outcome

(Byl et al., CID 1999, 29; 60-6)



Byl, *CID* (1999);29:60 –6

Risk factors for inappropriate antimicrobial therapy (AT) of bacteremia

- Bacteremia with septic shock
  - Decrease in mortality with appropriate AT
    24/36 (67%) vs 10/11 (91%) (p=0.11)
- Bacteremia without septic shock
  - Appropriate/inappropriate AT
    5 vs 13% (p<0.05)

(Byl et al, CID, 1999)

Activity profile of ID physicians

- Organic growth: people interested in antimicrobial use / diagnosis of infectious diseases, emerging from a range of disciplines

  general internal medicine >

  pneumo + ID, nefro + ID, ICU + ID
- Range of activity profiles: “organ” infections, HIV/AIDS, general internal medicine (in particular FUO and/or auto-immune diseases, CFS,…), rarity cabinet,…

The rise of ID physicians

- In the Netherlands fully accredited subspecialty within internal medicine, with specific training programme.
- In Belgium not a recognized subspecialty within internal medicine (likely a number of yrs away, because of problem of “horizontal” discipline encroaching on subspecialty competence), but de facto “ID”, most often practicing from a general internal medicine service or a separate unit in larger university hospitals.

Clinical microbiology

- Extension from laboratory more focused on appropriate usage of antibiotics, based on (rapid reporting + interpretation of) laboratory data.
- ID: more clinical-problem based approach.
- Not infrequently single type of consultancy within single hospital; can evolve however next to each other, with separate “territories”

  $\rightarrow$ limited synergy, possible antagonism, more likely “indifference”

ID/clinical microbiology interaction in Belgium

- Single scientific organisation encompassing ID and CM in Belgium
- Different officious working groups on topics in infectious diseases, with a balanced participation of ID and CM
  - IDAB on topics such as management of CAP, rational use of glycopeptides, management of meningoencephalitis, indications for MIC,…
  - Belgian version of Sanford guide to antimicrobial therapy

ID/ clinical microbiologist interaction in Belgium

- Balanced participation of officious ID/ CM in official government working parties: e.g. in guideline development groups for community and hospital based use of antibiotics
- Participation of both ID/CM in local hospital Therapeutic Committees
- Promotion of interaction at the local hospital level, indirectly through government initiative of “Antibiotic policy groups”.

Hospital antibiotic policy group

- Opportunity of integrating (existing?) initiatives to improve antibiotic prescribing policies within hospital.
- Open to both internal medicine, pediatrics, clinical biology (clinical microbiology) + clinical pharmacists (minimal composition) + other interested parties.
- Works under the “umbrella of the medical-pharmaceutical committee.
- Training programme.
- Pilot projects as a precursor to full implementation in 2003.

Hospital antibiotic policy group: tasks

- Development/updating of hospital formulary for antimicrobials.
- Development/updating of guidelines for empiric/directed therapy + prophylaxis (national guidelines of the Commission for the Coordination of Antibiotic Policy) + dissemination to hospital physicians

Hospital antibiotic policy group: tasks

- Development, implementation + evaluation of initiatives to curtail excessive antimicrobial consumption, through

- assesment of appropriateness of indication
- limitation of use of broadspectrum ab
- limitation of length of antimicrobial therapy + prophylaxis
- determination of local ab policy as a stringent framework for farmaceutical promotional activities towards physicians of the same hospital

Hospital antibiotic policy group: tasks

- Organisation of permanent training activities in the hospital towards medical/paramedical personnel from diagnosis to treatment , control of resistance + costs of ab treatment.
- Quality assessment + reporting.
- Laboratory based surveillance of resistance.
- Pharmacy-based surveillance of antimicrobial consumption per hospital service/ individual physician + reporting to hospital authorities.

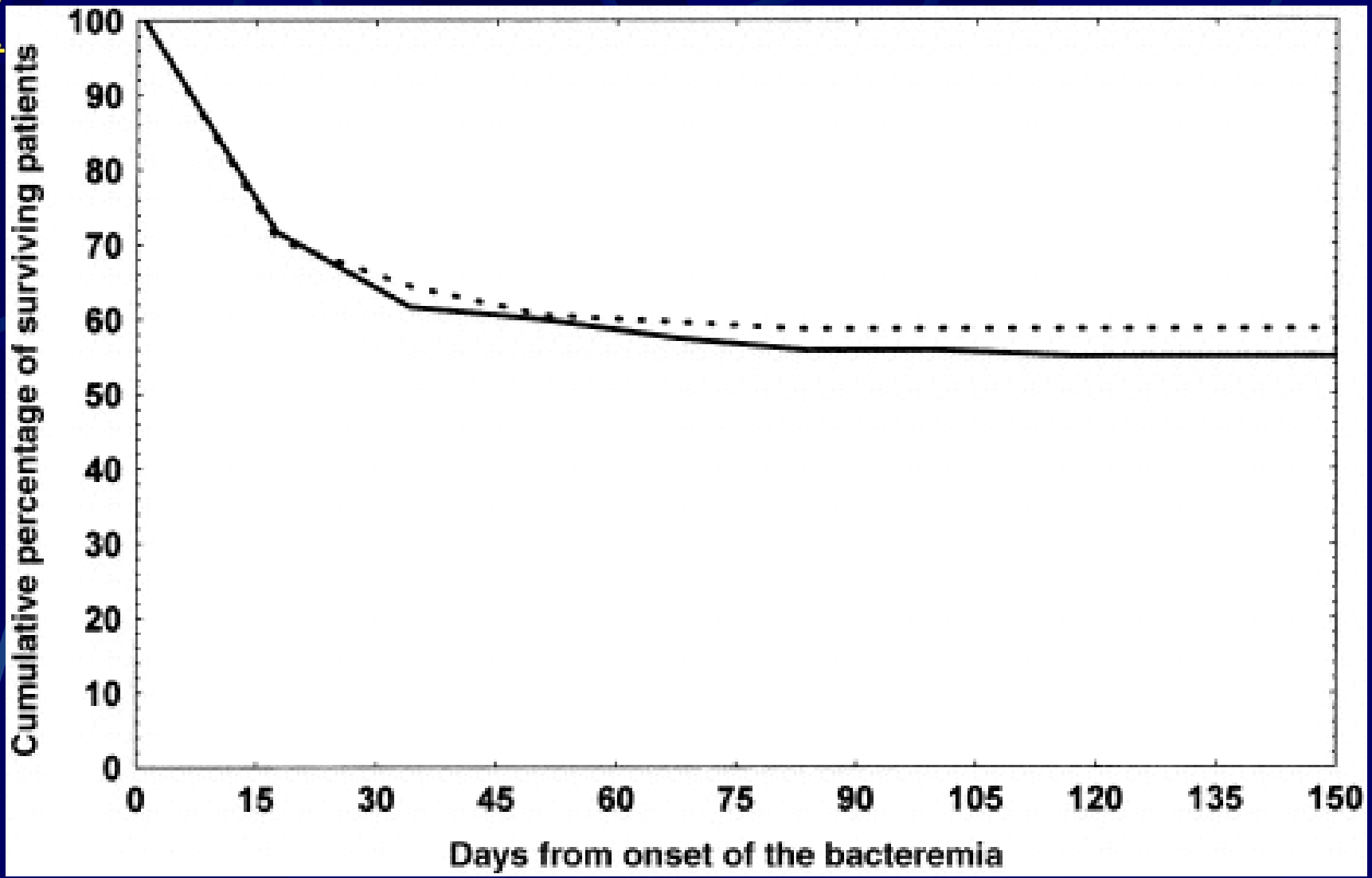
Hospital antibiotic policy group: tasks

- Yearly report to Ministry of Health + Commission for the Coordination of Antibiotic Policy on actions undertaken, indicators of the evolution of resistance within the hospital, use of antimicrobials,…
- Framework for obligatory cooperation between clinical microbiology, ID + clinical pharmacy

  → synergy necessary to tackle the huge problem/multiple tasks and to get results

Clinical microbiology/ ID interaction

- No literature on synergy.
- Separate impact of components of interactive process not measurable and the impact of a combined CM/ID on outcome measures not reported but very likely to remain positive (additive? Synergistic?)
- Deductive assumptions.



Survival curves for patients in the intensive care unit who had bacteremia caused by antibiotic-susceptible (dashed line) or antibiotic-resistant (solid line) gram-negative bacteremia (P=.319; log-rank test)

Blot, *CID* (2002);34:1600-1606

Table 2. Factors associated with bacteremia in a study of hospitalized, critically ill patients with nosocomial bacteremia caused by gram-negative bacteria.

Factor	Outcome of hospital stay			Type of bacteremia		
	Death (n = 141)	Survival (n = 187)	P	AB-S (n = 208)	AB-R (n = 120)	P
Source of the bacteremia						
Low risk	17.0	41.2	<.001	33.7	27.5	.247
Intermediate risk	22.7	25.1	.609	20.7	30.0	.060
High risk	60.3	32.6	<.001	45.7	42.5	.578
More than 1 possible source	9.2	10.0	.901	7.7	12.5	.152
Appropriate antibiotic therapy	89.3	94.6	.108	93.1	91.1	.547
Delay in antibiotic therapy, mean days ± SD	0.5 ± 0.9	0.7 ± 1.6	.296	0.5 ± 0.8	0.8 ± 2.0	.556

NOTE. Data are percentage of patients, unless otherwise indicated. AB-R, antibiotic resistant; AB-S, antibiotic susceptible.

Blot, *CID* (2002);34:1600-1606

Expert approach the clue to success

- High rate of appropriate therapy without significant delay in both groups (90% **!**)

DUE TO COMBINATION OF

- Consideration of previous colonisation by 3 times weekly site-specific surveillance cultures
- Initial broad-spectrum AB, narrowed upon results.
- Close interaction between physicians, clinical microbiologists, ID consultant

Blot, *CID* (2002);34:1600-1606

Medical care concept = 4 C

Communicate

Consult

Compromise

Cooperate

Trenholme, *J Clin Microbiol*. (1989); 27:1342

Thank You for Your Attention

Dirk Vogelaers