HOW DO WE DE-ESCALATE THERAPY FOR GRAM NEGATIVE NOSOCOMIAL INFECTIONS IN AN INFECTIOUS DISEASES INTENSIVE CARE UNIT?

Mónica Gomes, Diana Nunes, Tiago Marques, Sérgio Paulo, Carla Santos, Luis Caldeira
Unidade de Isolamento Respiratório, Serviço de Doenças Infecciosas, Hospital de Santa Maria CHLN - Lisboa

Introduction:

Antibiotic treatment for nosocomial infections by Gram negative bacteria (GNB) is a complex decision as it depends on several factors such as:

- Data on local antimicrobial susceptibility
- Double empirical antibiotic therapy needed in severe situations
- Rigorous investigation of source of infection
- Consideration of risk factors and comorbidities.

Objectives and aims:

- Description of treatment strategy in empirical and posterior de-escalation therapies in nosocomial infections by GNB in Santa Maria's Hospital Infectious Diseases Intensive Care Unit.
- Retrospective revision of the records of all the patients admitted between January 1st 2014 and November 5th 2015 with positive cultures for Gram Negative Bacilli.
- Assessment of infection type, risk factors for nosocomial and multi-resistant infections, empiric therapy choices and their adequacy, de-escalation and mortality rates.

Results

Table 1: Studied population

	Nosocomial	Non nosocomial	Total
Admissions	57	8	65
Positive cultures for GNB	57	15	72
Age median (min – max)	62 (25 – 93)	69 (45 – 89)	
Female	13 (25%)	7 (54%)	20
Type of infection			
Pneumonia	28	2	30
Pneumonia associated with invasive ventilation (PIV)	4	0	4
Tracheobronchitis	5	0	5
Urinary tract infection (UTI)	10	6	16
Prostatitis	1	0	1
Gastrointestinal	1	3	4
Skin and soft tissue	2	2	4
Catheter associated	1	0	1
Pneumonia + UTI	4	0	4
Peritonitis + PIV	1	0	1
Febrile neutropenia	0	1	1
Shock	5	7	12
Risk factors			
Previous antibiotherapy	22 (39%)	4 (31%)	26
Previous GNB colonization	13 (23%)	2 (15%)	15
APACHE median (min-max)	25 (8 – 46)	23 (11 – 36)	

Fig. 1: Empirical therapy in nosocomial infection

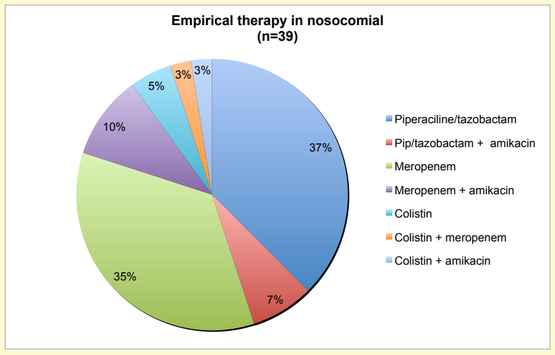

Table 2: Directed therapy

Bacteria isolated	n	Directed therapy
Enterobactereaceae non-ESBL and non- AMPc	3	Amoxicilin/clav, piperaciline/ tazobactam
Enterobacteriaceae ESBL	4	Piperaciline/tazobactam or ertapenem
Enterobacterecaceae AMPc	1	Cotrimoxazole
Klebsiella pneumoniae carbapenem R	2	Amikacine + phosphomicin
Klebsiella pneumoniae carbapenem R and also colistin R	3	Chloramphenicol + amikacine
Klebsiela pneumoniae carbapenem R + *Stenotrophomonas maltophilia*	1	Colistin + cotrimoxazole
Stenotrophomonas maltophilia	1	Ceftazidime
Pseudomonas aeruginosa MS	3	Piperaciline/tazobactam

Table 3: Non-apropriate empirical therapy

Bacteria isolated	n	Empirical therapy
Enterobacteriaceas AMPc	3	Piperaciline/tazobactam
Klebsiella pneumoniae carbapenem R	1	Meropenem
Pseudomonas aeruginosa piperaciline/tazo*bactam R + E. coli* ESBL amikacin R	1	Piperaciline /tazobactam + amikacin
P. aeruginosa carbapenem R + *Stenotrophomonas maltophilia* piperaciline/tazobactam S	1	Meropenem
Stenotrophomonas maltophilia	1	Meropenem
Acinetobacter baumanii	3	1 Piperaciline/tazobactam 1 Meropenem 1 Meropenem + amikacin

Fig.2: Empirical vs directed antibiotherapy (n=57)

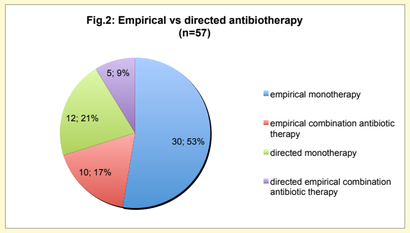

Table 4: De-escalation in adequate therapy in nosocomial (n = 29)

De-escalation	11 (38%)
No de-escalation	14 (48%)
Switched	4 (14%)

Table 5: Non de - escalated therapy

Bacteria isolated	n	AB and Comments
Enterobacteriaceae ESBL	2	1 Piperaciline/tazobactam 1 Meropenem and amikacin (imunocompromised transfered before culture's results)
Enterobactereacea AMPc	3	2 Meropenem 1 Pip/taz (acute traqueobronchitis)
Klebsiella pneumoniae carbapenem R	2	Colistin + meropenem
Pseudomonas aeruginosa MS	4	Piperaciline/tazobactam
Pseudomonas aeruginosa carbapenem R, pip/ tazobactam, ceftazidime, AG e ciprofloxacine	1	Colistin + meropenem (pip/tazobactam and aminoglicosides allergy; double therapy , HIV-1 + lymphoma)
Acinetobacter baumanii	2	Colistin, previous MDR infection

Table 6: De - escalated therapy

Bacteria isolated	n	Comments
Enterobactereaceae non-ESBL , non- AMPc	3	AB narrow-spectrum/ if cefalosporin R, one generation above
Enterobacteriaceae ESBL	5	Ertapenem or pip/tazobactam or cotrimoxazole
Enterobacterecaceae AMPc	1	Ertapenem
Pseudomonas aeruginosa MS	2	Piperaciline/tazobactam

Table 7: Descriptive of patients who died

(n=10)	
Variables	N (%) or mean (sd)
Age	64.8 (16)
Age <= 65 yo	4 (40%)
APACHE	28 (5)
APACHE <20	0 (0%)
Female	4 (40%)
Hemodialysis	3 (30%)
Mechanical ventilation	6 (60%)
Appropriate antibiotherapy	2 (20%)
De-escalation	4 (40%)

Discussion:

The widespread use of quinolone at a national level has lead to high enterobctereaceas and non-fermenting bacteria resistance rates. Using ciprofloxacine as part of double empirical therapy for Gram negative bacteria nosocomial infections is therefore inadequate in our institution. Thus amikacin is preferred given its preserved sensitivity in most situations. Moreover, carbapenemase-producing *Klebsiella pneumoniae* are commonly detected since 2009 in our institution. De-escalation is done by default and considered a necessary and effective strategy to reduce antibiotics use and bacterial resistance, which is key in situations where a broad-spectrum therapy is needed for treating Gram negative nosocomial infections.