

Multidrug-resistant *Acinetobacter* meningitis in neurosurgical patients with intraventricular catheters (IVC)

Oscar Martínez, Ana Fleites, A. Blanco, V. Pintado, M. Alvarez, Javier Fernández Domínguez, Susana Rojo Alba, M. Telenti, F. Vazquez, A. Rodríguez-Guardado. Microbiology Unit. Tropical Medicine Unit. Hospital Universitario Central de Asturias. and Universidad de Oviedo. Hospital Ramon y Cajal Madrid.

Objective:

✓ The aim of this study is to describe the characteristics of the neurosurgical meningitis due to *Acinetobacter baumannii* with special accent the factors that condicion their outcome.

Material and Methods

✓ All patients adults with nosocomial postsurgical meningitis due to *A. baumannii* related with IVC intraventricular catheters diagnosed at the Hospital Central de Asturias Oviedo, and Hospital Ramon y Cajal (HRC), Madrid between 1990-2014 were retrospectively.

✓ Nosocomial meningitis was defined according to the CDC A positive CSF culture or Gram stain with normal levels of glucose, proteins and cell count in absence of clinic was considered as a contamination and discarded

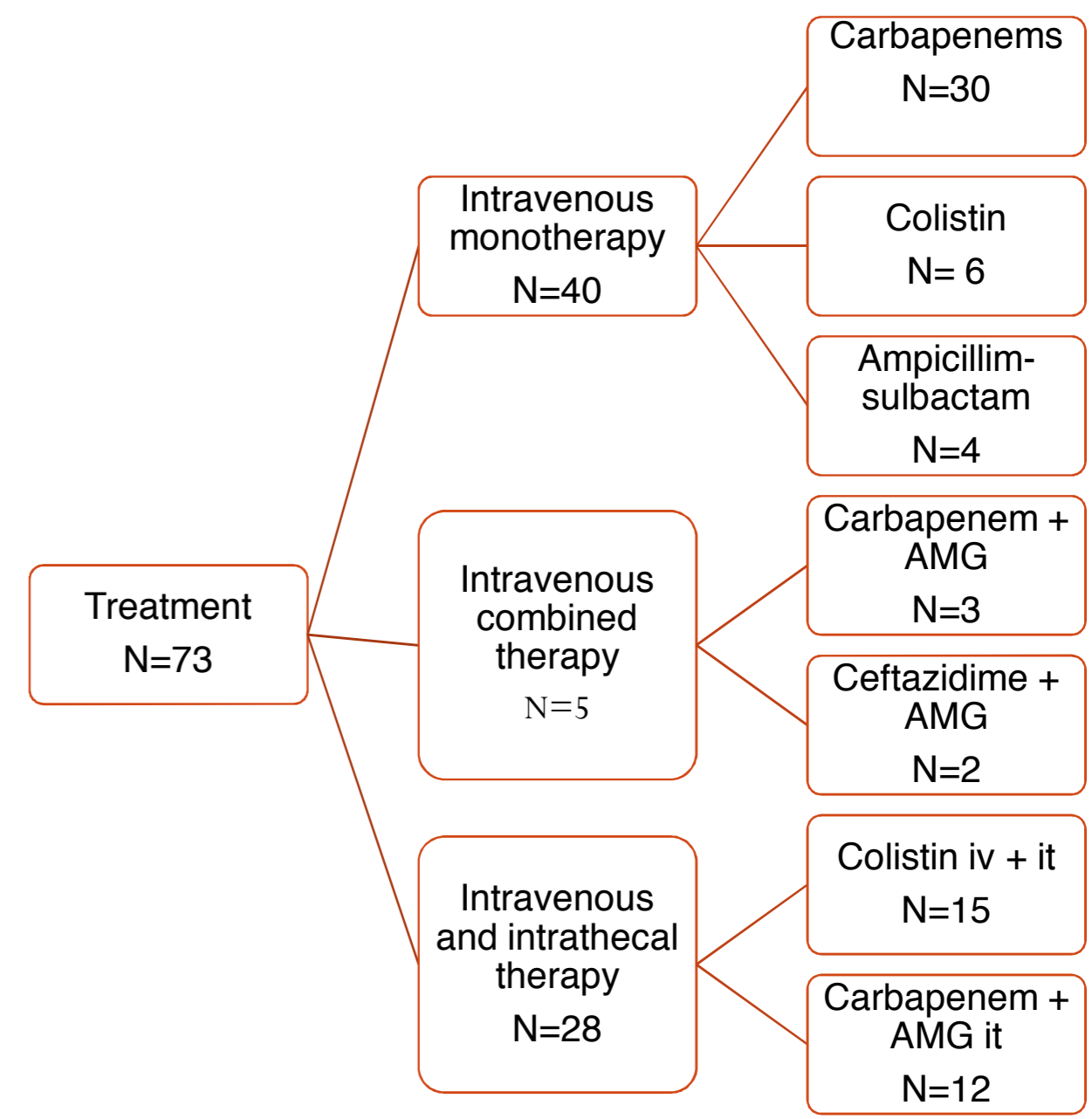
✓ The treatments included the following parenterally administered antibiotics: imipenem 1 gr/ 8 hours, meropenem 2 gr /8 hours, ceftazidime 3 gr/8 hours, amikacin 500 mg/8 hours, ampicillin-sulbactam 3 gr /8 hours, sodium colismethate 5 mg/kg/day administered in three doses in patients with normal renal function . In some cases the treatment were administered intrathecally: colistin (10mg/12 hours), or gentamycin ,or tobramycin (both at 10 mg/24 hours respectively) or intrathecal amikacin (20 mg/24 hours)14.

✓ Cure was achieved when two successive cultures were negative and clinical signs of infection (fever, meningismus) were absent. To assess survival, patients were followed up until they died in the hospital or were discharged.

POBLATION

75 patients, 72% men, mean age of 46 [15] years. Mean time between the surgery and the infection was 27[19] days (range 7-99). Mean of permanence of IVC before the diagnosis was 22 [14].

Characteristics	univariable analysis			
	Dead (n=25)	Cure (n=50)	P value	Odds ratio
Demographic				
Age	52[13]	42[15]	0.183	
Sex(Male/Female)	19/6	35/15	0.585	0.74 [0.21-2.49]
ICU/Neurosurgery	14/11	43/7	0.008	4.827 [1.570-14.841]
Stay before the surgery	31[26]	24[13]	0.002	
Underlying diseases (Y/N)				
Haemorrhagia	15/10	25/25	0.468	1.510[0.567-3.970]
Brain Neoplasm	6/19	7/43	0.338	1.940[0.575-6.549]
Head Trauma	2/23	17/33	0.014	5.92[1.13-48.15]
Hydrocephalus	2/23	1/49	0.256	4.261[0.367-49.428]
Time of catheter	26[22]	21 [11]	0.036	
Pure culture/mixed flora	19/6	37/13	1.000	1.113[0.365-3.391]
Adequate empiric treatment	8/17	31/19	0.014	3.47[1.13-10.920]
CSF characteristics				
leukocytes	5139[10149]	1331[2085]	0.0001	
glucose	29.84[17.6]	32.54[19.9]	0.669	
proteins	320[161]	285[167]	0.878	
Treatment (Yes/No)				
Carbapenems (Yes /no)	14/11	16/34	0.079	2.705[1.007-7.266]
Carbapenem + ITtherapy	3/22	9/41	0.740	0.621[0.152-2.533]
Colistin monotherapy	2/23	4/46	1	1.000[0.170-5.869]
IV + IT Colistin	0/25	15/35	0.001	
Ampicillin- sulbactam	1/24	3/47	1	0.653[0.064-6.616]
Combined IV therapy	3/22	4/46	0.680	1.568 [0.323-7.620]
IT Treatment	5/20	25/25	0.014	4.000[1.16-14.51]
AMG IT treatment	5/20	10/40	1.000	1.000[0.301-3.321]
Adequate (Yes/No)	18/7	50/0	0,0001	3.778 [2.542-5-614]
Days of treatment	11[7]	20[6.]	0.037	1.691[5.78-12.21]
Catheter removal	10/15	42/8	0.0001	7.88[2.32-27.89]



Mortality was significantly associated with lack of removal of the intraventricular catheters. The mortality was lower in patients treated with colistin I IV and IT that in those treated with carbapenem only and in the patients on intrathecal and IV therapies than in those on exclusive parenteral treatment . However when analyzed the intrathecal treatment with amynoglicosides and not colistin we didn't find significant differences.

In the multivariable analysis the mortality only was for the removal catheter (0.014) and colistin iv plus it treatment (0,003).

Conclusions

Nosocomial meningitis by *Acinetobacter baumannii* associated with intraventricular devices is an infection with high mortality. Although the appearance of resistances has complicated its treatment, the combination of intrathecal and intravenous colistin is an option as safe and effective as that of carbapenems.