

Postsurgical meningitis by *Pseudomonas aeruginosa*: Prognostic factors and evolution.

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BACKGROUND

- Pseudomonas aeruginosa* meningitis is a rare condition which is usually associated with pathology in the ORL field, neurosurgery or local neurologic manipulations.

OBJETIVE

- The aim of this study is the description of the characteristics of the neurosurgical meningitis due to *Pseudomonas aeruginosa* emphasizing the factors influencing their outcome.

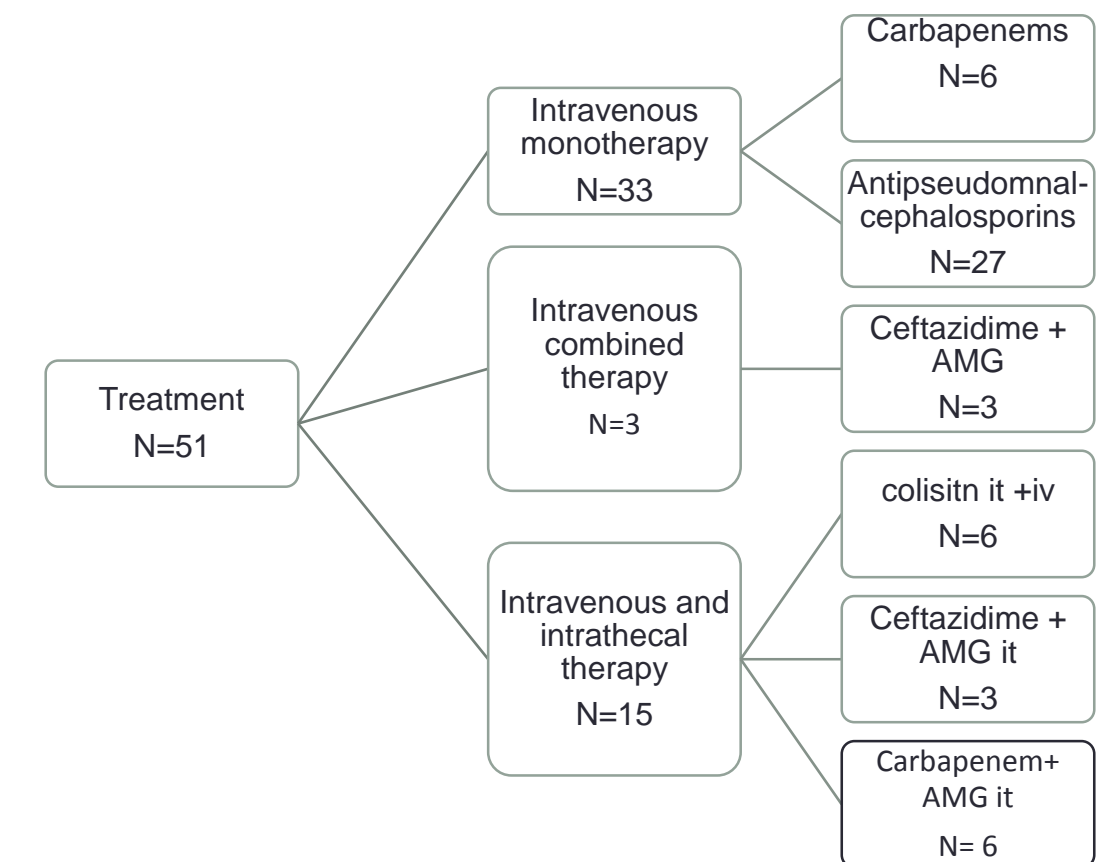
METHODS

- All patients adults with nosocomial postsurgical meningitis due to *Ps aeruginosa* diagnosed between 1990-2014 were retrospectively reviewed.
- 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, 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).
- 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.
- Quantitative variables were analyzed with the Student t test or the Mann-Whitney test when appropriate. Qualitative variables were analyzed with the chi square test with the Yates correction or Fischer's exact test (2-tailed) when needed. Significance was designated at $p < 0.05$.

✓51 CSF cultures for *Pseudomonas aeruginosa* were found in 51 different patients (58,8%% men, mean age of 50 [18] years. The mean time elapsed between the surgery and the onset of the infection was 22[20] days (range 3-112). The mean of permanence of IVC before the diagnosis was 21 [19]. The characteristics of CSF were: white cell count 6,964 [33,569] cell/mm³, protein 321[314] g/dl and glucose 49[37] mg/dl. The most frequent underlying disease were: hemorrhage (33,3%), neoplasm (33,3%), head trauma (27,5%) and hydrocephaly (5,9%) . Seventy-six percent of patients had a intraventricular catheter, 17% a CSF leakage and 6% a peritoneal device. Polymicrobial meningitis was found in ten patients

Characteristics	univariable analysis			
	Dead (n=17)	Cure (n=34)	P value	Odds ratio
Demographic				
Age	53[17]	49[18]	0.001	
Sex(Male/Female)	5/12	16/18	0.183	0.74 [0.21-2.49]
ICU/Neurosurgery	7/9	19/14	0.387	
Stay before the surgery	21[16]	21[21]	0.080	
Underlying diseases (Y/N)				
Haemorragia	5/12	12/22	0.463	
Brain Neoplasm	8/9	9/25	0.125	
Head Trauma	3/14	11/23	0.221	
Hydrocephalus	1/16	2/32	0.745	
Pure culture/mixed flora	12/5	29/5	0.190	1.113[0.365-3.391]
Adequate empiric treatment	10/7	31/3	0.010	3.47[1.13-10.920]
CSF characteristics				
leukocytes	824[972]	10034[4096]	0.095	
glucose	51[49]	48[30]	0.920	
proteins	312[408]	326[261]	0.738	
Treatment (Yes/No)				
Ceftazidime	14/3	19/15	0.057	3.684[0.892-15.225]
Carbapenems (Yes /no)	2/15	4/30	0.688	
IV + IT Colistin	0/17	6/28	0.075	0.622[0.496-0.781]
AMG IT treatment	2/15	7/27	0.359	0.514[0.096-2.797]
Combined IV therapy	1/16	2/32	0.745	
IT Treatment	2/15	13/21	0.048	0.215[0.042-1.099]
Adequate (Yes/No)	10/7	31/3	0,0001	3,14 [3.33-15,6]
Catheter removal	5/12	24/10	0.006	5.74 [1.51-12.29]

RESULTS



- There is not differences in sex, time of , mixed culture, in dead and survival patients. Mortality was higher in patients with neoplasm (70%) but without significantly differences ($p=0.125$) Mortality was significantly associated with older age (53[17], vs 49[18], $p=0.001$),, lack of removal of the intraventricular catheters $p= 0.006$, OR: 5.74 [1.51-12.29] and an inadequate empiric treatment ($p= 0,010$, OR 3,14 [3.33-15,6]) , The mortality was lower in patients treated with colistin intravenous and intrathecal (0 vs 17, $p=0,075$ OR= 1.61 [1.28-2.02]

CONCLUSIONES

- Nosocomial meningitis by *Pseudomonas aeruginosa* is an infection with high mortality associated with lack of removal of the intraventricular catheters, older age and absence of intrathecal therapy .
- The use of colistina intravenous and intrathecal combined with carbapenems or cephalosporins is a useful and safe option