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I.V. Vs I.V. COLISTIN

Thirumal Y¹, Sharma Sanjeev², Alugolu Rajesh³

¹Resident in Neurosurgery, Department of Neurosurgery, Nizam's Institute of Medical Sciences, Punjagutta, Hyderabad- 500082, India.

²Consultant, Department of Clinical Pharmacology, Apollo Hospitals, Jubilee Hills, Hyderabad, India.

³Assistant Professor, Department of Neurosurgery, Nizam's Institute of Medical Sciences, Punjagutta, Hyderabad-500082, India.

ABSTRACT

Isolation of infective agents and knowing the sensitive antibiotics is a herculean task. When the site of infection is an inaccessible or is protected naturally by barriers, the mode and dose of drug to be delivered becomes more important. We have highlighted such an issue.

Key Words:- Colistin, Intravenous, Intraventricular, Pseudomonas.

INTRODUCTION

Infections with multi-drug resistant *Pseudomonas aeruginosa* are difficult to treat and more so if it occurs in a postoperative neurosurgical setup with a background of immune suppression. A plethora of antibiotics alone or in combination have been tried to combat the infection. We herein report our experience of treating multi-drug resistant *Pseudomonas aeruginosa* meningitis with intraventricular colistin, highlighting that route of administration can also be manipulated for better outcomes.

REVIEW ON CASE REPORTS

A 56-year-old male, a postoperative case of frontal anaplastic astrocytoma who had received radiotherapy and chemotherapy with idiopathic thrombocytopenic purpura (ITP) was admitted for recurrence of tumor 3 years following initial surgery. He received multiple platelet transfusions and was on high dose steroids for correction of platelet count. Following surgery, the patient developed meningitis. Cultures of

cerebrospinal fluid showed growth of *Pseudomonas aeruginosa*, sensitive to colistin alone (MIC- 0.5µg/ml). His other CSF parameters were suggestive of bacterial infection (Table 1). He was started on intravenous colistin (i.v.) at a dose of 80mg or 2million units, 8th hourly for 3 weeks, along with steroids (prednisolone 40mgs/day for ITP). He was monitored for nephrotoxicity and general parameters. Though his fever subsided, the CSF was still turbid and was showing growth. The patient developed CSF leak along with wound dehiscence. Debridement, re-repair of dura with fascia lata graft, trans-position of scalp flap with split skin grafting of raw area was done at 4th week. The split skin graft healed well, however on removing the sutures of the rotational flap on day 7, CSF leak ensued. The patient was receiving colistin all through these 5 weeks. A ventricular reservoir was placed for external ventricular drainage and for instillation of intraventricular colistin (IV) at a dose of 10mg once a day. Just after three doses of intraventricular colistin, the CSF became clear, with improvement in the sugar levels, with negative staining and cultures. The patient however, succumbed to multisystem failure.

This makes us to think over as to the ideal route to treat CNS infections as there is a strong blood-brain

Corresponding Author

Alugolu Rajesh

Email:- drarajesh1306@gmail.com

barrier which limits the egress of the drug at the site of actual conflict. Intraventricular instillation however requires exposure of the ventricular system to the outside world, which itself can increase the infective complications. Colistin is generally administered via the intraventricular (IVT) or intrathecal route alone or in association with the systemic route in meningitis. The dosages of intraventricular/intrathecal colistin are not very clear and range between 1.6 and 40 mg, as a single dose or in divided doses (Falagas *et al.*, 2007; Imberti *et al.*, 2012). As per published literature by the Infectious

Diseases Society of America (IDSA) in 2004, intraventricular dosage of colistin should be 10 mg, but the optimal intraventricular/intrathecal dosing regimen for Colistin still remains unknown (Tunkel, 2004). The penetration of colistin into cerebrospinal fluid (CSF) is poor, both in patients with uninflamed and inflamed meninges (Jiménez-Mejías *et al.*, 2002). CSF-to-serum concentration ratios range from 0.051 to 0.16 (Khawcharoenporn *et al.*, 2010). Moreover colistin is available in international Units not in milligrams (Markantonis *et al.*, 2009).

Table 1. CSF parameters before and after treatment with I.V. and I.V. Colistin

Parameter	Initial CSF parameters	Intravenous Colistin (80mgs/2million units, 8 th hrly X 4weeks) {iv}	3 doses of Intraventricular (IV) colistin 5mg
CSF/Blood sugars (mg/dl)	15/215	24/170	48/160
CSF proteins(mg/dl)	104	300	147
Chloride (mEq/ml)	106	113	108
Leukocyte count (per mm ³)	10	5000	40
Red blood cells (per mm ³)	6	4500	-
Physical appearance	Light yellow	Turbid	Clear
Gram stain	gram-negative	gram-negative	No organisms
CSF culture	<i>Pseudomonas aeruginosa</i>	<i>Pseudomonas aeruginosa</i>	No growth

SUMMARY AND CONCLUSION

With extensive review of literature we found 1mg of colistin is equal to 11,494 international units. In retrospection, could we have helped the patient, had we

had introduced intraventricular colistin early in the phase of treatment. Inrtaventricular colistin is a useful adjunct and may be added to treatment regimen for early clearance of CSF in addition to systemic therapy.

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