Citrobacter freundii

Citrobacter species is an unusual cause of cerebral abscesses in infants. In particular, Citrobacter freundii can invade and replicate in human brain microvascular endothelial cells with selective neurovirulence, producing ventriculitis and brain abscesses mainly in the infant. A delayed brain abscess caused by C. freundii species in adult patients and after surgery is an occurrence that has not yet been reported in the literature.

Case description: The authors reported a case of a 60-year-old patient that presented a delayed postoperative brain abscess following the resection of a left parietal convexity meningioma. Surgery was performed, with bone flap removal, debridement, and culture of the purulent content of the previous surgical cavity. The microbiological examination showed the isolation of C. freundii. Postoperatively, the patient improved, with progressive headache reduction and right upper limb weakness improvement. She was continued on medical therapy for 4 weeks until her inflammatory index and white blood cell count gained normal range, then, she was admitted to a neurorehabilitation center.

A delayed brain abscess caused by C. freundii in adult patients and after surgery is an occurrence that has not yet been reported in the literature, with consequent complex management, due to the lack of clear guidelines [1)]

Nosocomial neuroinfections due to Enterobacteriaceae represented 9.5% in a cohort of 171 cases of paediatric meningitis within last 15 years. Commonest etiologic agents was E. coli - 9 (50%) followed by Klebsiella pneumoniae - 3 (16,7%) and Enterobacter cloacae. Citrobacter freundii, Proteus mirabilis and Salmonella enteritidis (1 each). Commonest risk factors were neonatal age 13 - (72.2%), very low birth weight 5 (27.8%), craniocerebral trauma - 4 (22.2%) and neurosurgery - 5 (27.8%). All but 1 case were treated with antibiotics: 8 with III-rd and 3 with IV-th generation cephalosporins (ceftazidim, cefotaxim and cefepim) 2 with meropenem and 4 with ciprofloxacin: Nosocomial meningitis due to enterobacteriaceae was associated with significantly high mortality (29.9% vs. 15.1% in all cohort of pediatric meningitis - $p<0.02$) [2)].

1)
Costanzo R, Scalia G, Ponzo G, Furnari M, Iacopino DG, Nicoletti GF, Umana GE. Brain abscess after meningioma removal caused by Citrobacter freundii infection in an adult. Surg Neurol Int. 2022 Sep 16;13:416. doi: 10.25259/SNI_742_2022. PMID: 36324974; PMCID: PMC9610370.
2)
Benca J, Ondrusova A, Rudinsky B, Bauer F, Kovac M. Nosocomial meningitis caused by Enterobacteriaceae: risk factors and outcome in 18 cases in 1992-2007. Neuro Endocrinol Lett. 2007 Jun;28 Suppl 2:27-9. PubMed PMID: 17558373.