

Poster presentation

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Early antibiotic administration prevents cognitive damage induced by pneumococcal meningitis in Wistar rats

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Bacterial meningitis is an infection of the central nervous system characterized by a strong inflammation of the meninges and the subarachnoid space. Pneumococcal meningitis in humans is associated with long-term sequelae including sensory-motor deficits, seizures, and impairments of learning and memory. In order to evaluate this in an animal model, *Streptococcus pneumoniae* was cultured overnight in Todd Hewitt broth, diluted in fresh medium and grown to logarithmic phase, washed and resuspended in sterile normal saline 5×10^9 cfu/ml. Meningitis was induced by inoculating 10 μ L of the *S. pneumoniae* suspension into the cisterna magna of the animals (rats, 60 days old, weighing 250–300 g) after removal of 10 μ L of cerebrospinal fluid (CSF). All surgical procedures and bacteria administrations were performed under anesthesia. Meningitis was documented by a quantitative culture of 5 μ L of CSF obtained by puncture of the cisterna magna at 8 h and 16 h after infection followed by the initiation of the antibiotic treatment (ceftriaxone 100 mg/kg bid). On day 10, rats were submitted to a behavioural task. Habituation to an open field was carried out in an open arena divided into 9 equal rectangles by black lines. Animals were gently placed on the left quadrant, and was allowed to explore the arena for 5 min (training session) and 24 hrs later submitted again to a similar session (test session). Crossing of the black lines and rearing performed in both sessions

were counted. All data are presented as mean \pm SD. Data were analyzed by Student's T test, considered $p < 0.05$ to be significant. In the rats that were treated with antibiotic beginning at both 8 h and 16 h after infection no differences in the number of crossings and rearings were observed between groups in the habituation to the open-field training session ($p > 0.05$). In the test session, in animals that antibiotic starts 8 h after infection, we did not observe reduction in both crossings and rearings in meningitis survivors rats compared with sham ($p > 0.05$). However, in rats that antibiotic starts 16 h after infection, we observed a significant reduction in both crossings and rearings in meningitis survivors rats compared with sham ($p < 0.05$). In conclusion, early antibiotic administration (8 h after infection) prevents cognitive damage induced by pneumococcal meningitis in Wistar rats.

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