Overuse of empirical antibiotics in viral meningitis: a tertiary centre study

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Background

- Emergency physicians often prescribe empirical antibiotics for suspected viral meningitis
- Issues with antibiotic overuse
  - Side effects
  - Antimicrobial resistance

Bacterial meningitis

- Key pathogens
  - Streptococcus pneumoniae (72%)
  - Neisseria meningitidis
  - Listeria monocytogenes
  - Haemophilus influenzae

S. pneumoniae susceptibility

- Australian Government: Department of Health data
  - 3% reduced susceptibility and 0.5% absolute resistance to ceftriaxone/cefotaxime in 2010
  - Resistance has remained stable over past 10 years but risk of increase without judicious antibiotic use

Objective

- To identify the rate of empirical antibiotic administration in viral meningitis cases
- To identify the rate of empirical antibiotic administration in cases negative for both bacterial and aseptic meningitis

Method

- Retrospective case series
- Australian tertiary hospital
- All patients with lumbar puncture for suspected meningitis in ED from August 2017 to July 2018
- All ages included

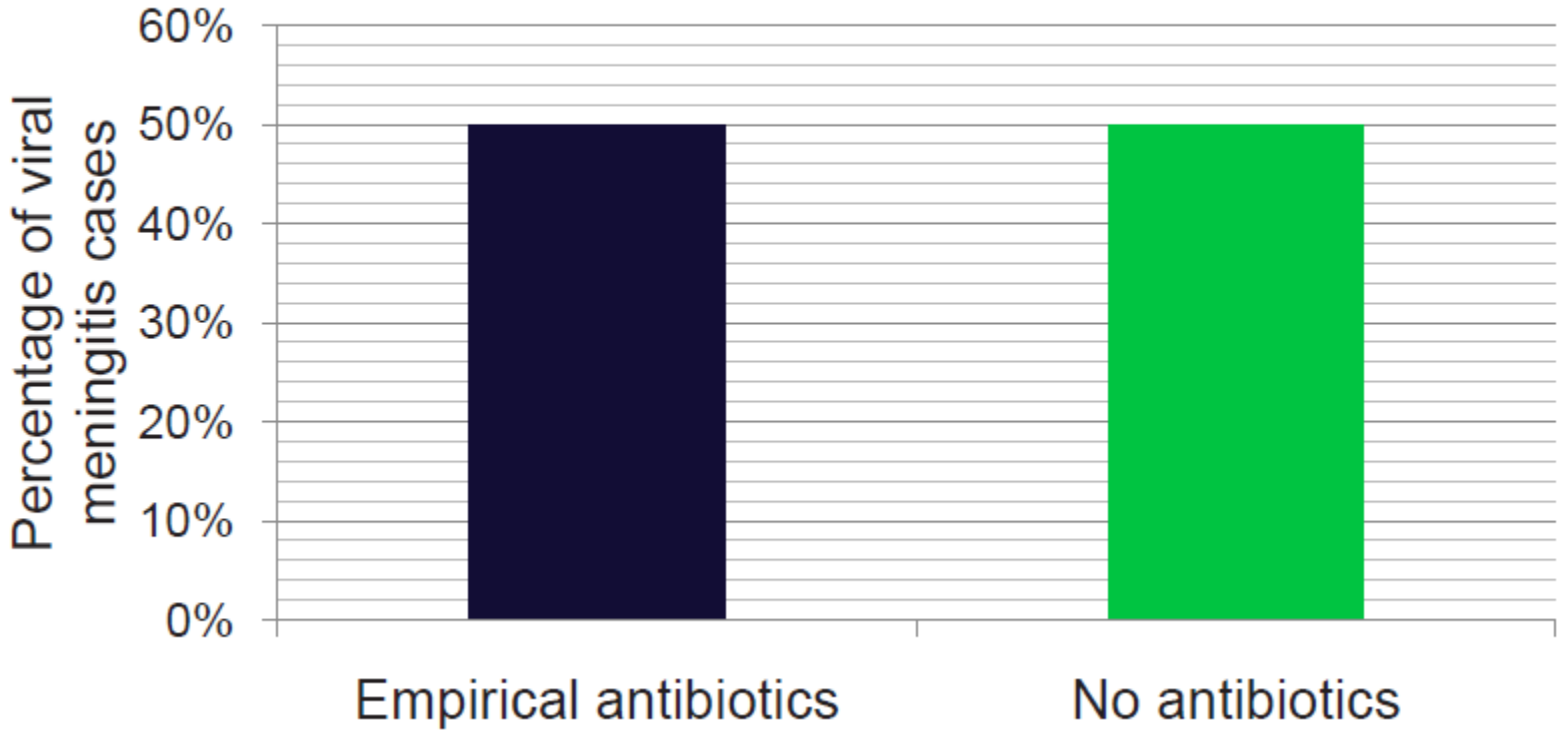
Results

- n = 79
- 13% (10/79) viral meningitis (CSF PCR)
  - 80% (8/10) enterovirus
  - 20% (2/10) varicella zoster virus
- 1% (1/79) bacterial meningitis
- 3% (2/79) aseptic meningitis other cause

Results: viral meningitis cases

- All patients were aged 18 years or older
- 50% (5/10) received empirical antibiotics in ED
- All viral meningitis cases admitted to hospital
- Average length of stay 1.5 days

Chart 1: Initial Treatment of Viral Meningitis in ED



Results

- Patient with bacterial meningitis (1/79) received appropriate antibiotics in ED

Discussion

- Impact of polymerase chain reaction results on patient management during a viral meningitis outbreak in Tropical North Queensland.
  - Emerg Med Australas. 2012 Feb;24(1):52-6.
  - Antibiotics in 37/43 (86%) of patients

Discussion

- Incidence, aetiology, and sequelae of viral meningitis in UK adults: a multicentre prospective observational cohort study
  - Lancet Infect Dis. 2018; 18: 992–1003
  - n = 638, 69% (160/231) of viral meningitis cases received empirical antibiotics

Discussion

- Rates of empirical antibiotic administration ≥50%
- No prospectively validated clinical decision rule with non-CSF parameters to distinguish between bacterial and viral meningitis

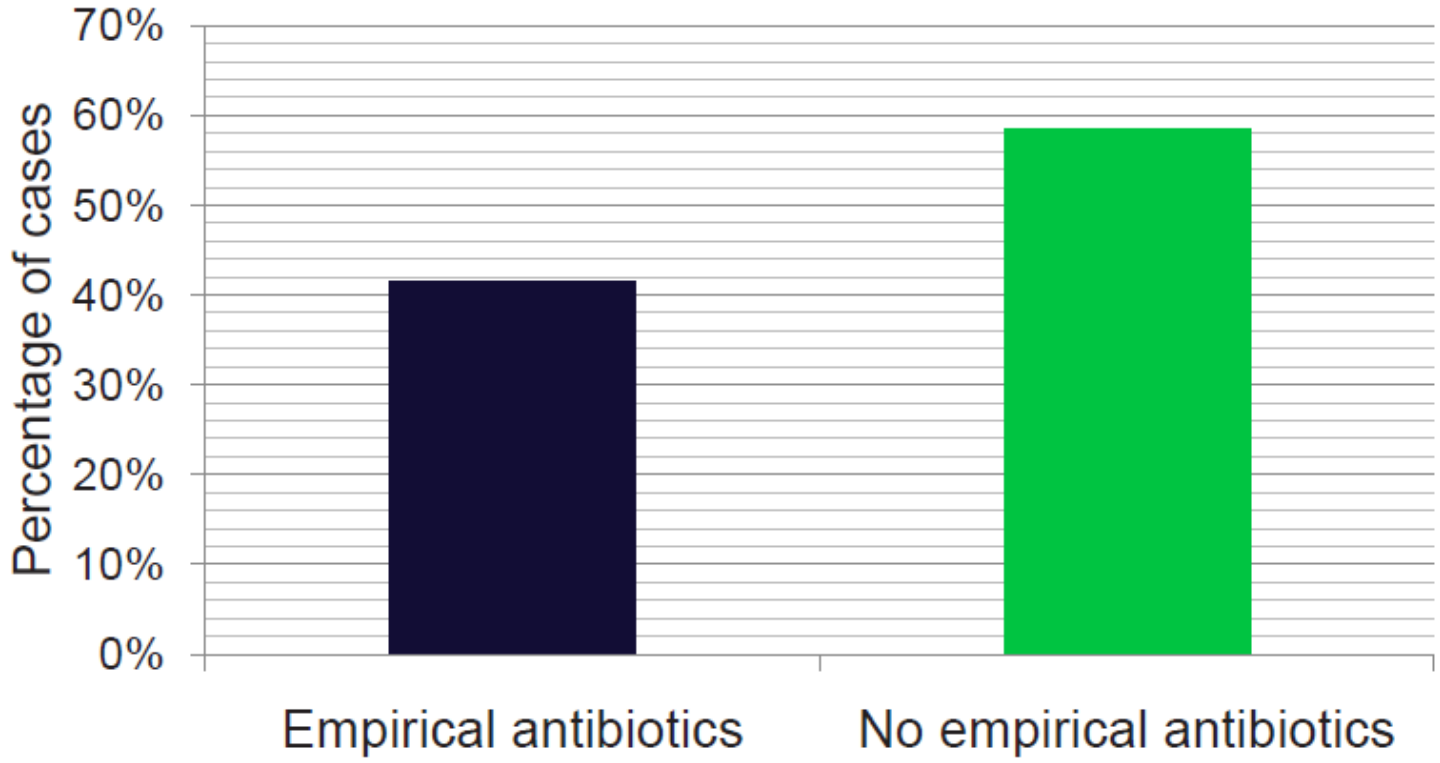
Discussion

- Clinical decision rules with non-CSF parameters
  - Oostenbrink et al. 2004
    - Meningeal irritation, vomiting, cyanosis, petechiae, disturbed consciousness, CRP, duration of symptoms
  - Brivet et al. 2005
    - Altered consciousness, seizures, focal neurological deficit and shock

Results

- 41% (17/41) of adults with negative lumbar puncture for bacterial and aseptic meningitis received empirical antibiotics

Chart 2: Treatment of adults with negative lumbar puncture for bacterial and aseptic meningitis in ED



Discussion

- Incidence, aetiology, and sequelae of viral meningitis in UK adults: a multicentre prospective observational cohort study
  - Lancet Infect Dis. 2018; 18: 992–1003
  - 72% (328/454) of cases which did not have meningitis received empirical antibiotics

Discussion

- Large proportion of patients with negative lumbar puncture for bacterial and viral meningitis receiving antibiotics
- Stable patients can probably wait for CSF results prior to administration of antibiotics

Conclusion

- More research needed on clinical strategies to diagnose meningitis and distinguishing between bacterial and viral meningitis
- Consider waiting for lumbar puncture results without giving empirical antibiotics in stable patients with suspected viral meningitis

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