



# Missed opportunities in patients with suspected meningitis

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## Introduction

Meningitis is a relatively common condition seen within acute medicine. Prompt recognition, investigation and initiation of appropriate therapy are essential to preventing the potentially serious sequelae. The use of CT brain imaging, which may delay this process, as well as the antiviral drug acyclovir are commonplace, even when their use may be unnecessary. To better understand local practice, we undertook a retrospective review of adult meningitis cases at the Leicester Royal Infirmary.

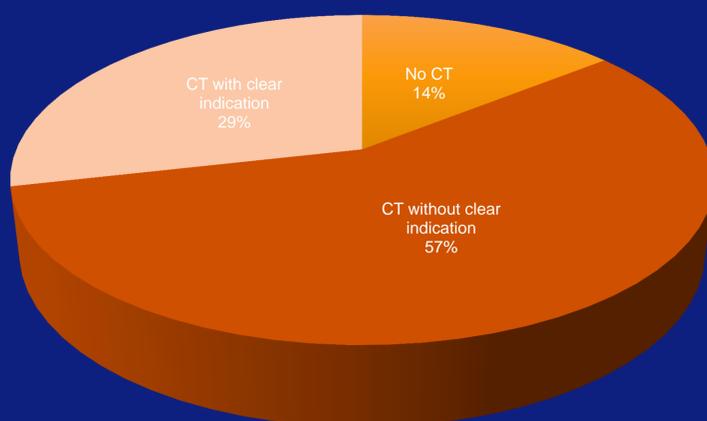
## Methods

All patients discharged with a coded diagnosis of meningitis (bacterial or viral) between May 2016 and June 2017 were included. Patient case notes, blood and microbiology results, as well as radiology were reviewed. Practice was measured against both Trust and current British Infection Association standards on the management of suspected meningitis.

## Results

A total of 35 patients were identified. Of these 15 were male and 20 were female with the mean age overall of 41. 29 patients underwent CT brain, of which only 10 had clearly documented indications such as reduced consciousness. The mean time from admission to lumbar puncture was 1737 minutes. All patients with suspected bacterial meningitis received appropriate antibiotics and the median time from admission to antibiotics being administered was 64 minutes.

CT Scans

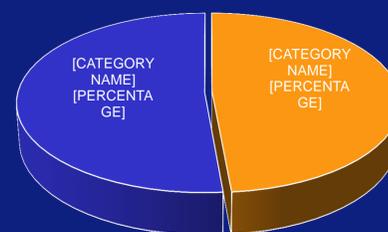


Fundoscopy was only attempted in 6 patients. Acyclovir use appeared indicated in only 4 cases, however 13 other patients received it. Steroids were given to 4 patients (2 bacterial vs 2 viral meningitis). Amongst those not receiving steroids, 2 patients with pneumococcal disease later developed conductive hearing loss and cortical blindness respectively. Of the 6 patients who required antibiotic cover for Listeria only 3 were treated. 8 patients had confirmed bacterial meningitis (via PCR or culture) and 11 patients were confirmed viral meningitis (via PCR). There were no deaths.

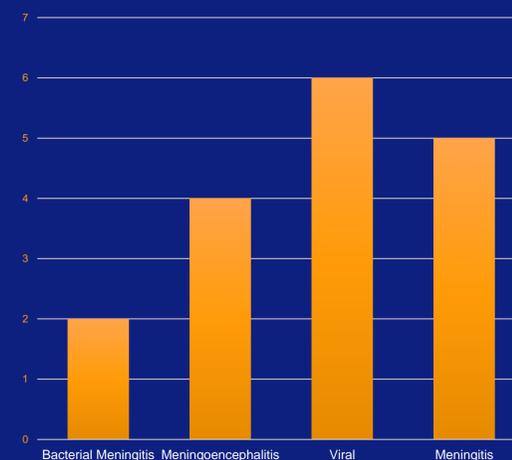
## Key findings

- Median time to antibiotics 64 minutes.
- 2 patients (both with pneumococcal meningitis) developed complications of cortical blindness and bilateral hearing loss. No patients died.
- 4 out of 35 patients received steroids.
- Out of 6 patients requiring cover for Listeria only 3 were treated.
- 55% of Lumbar Punctures were conducted by registrars.
- Median length of hospital stay was 5 days (13.25 for bacterial meningitis vs 3.5 for viral meningitis patients).
- Serum glucose was only sent in 3 patients.
- 6 patients had their opening pressure recorded.
- All patients with bacterial meningitis received appropriate antibiotic coverage early on in their admission.

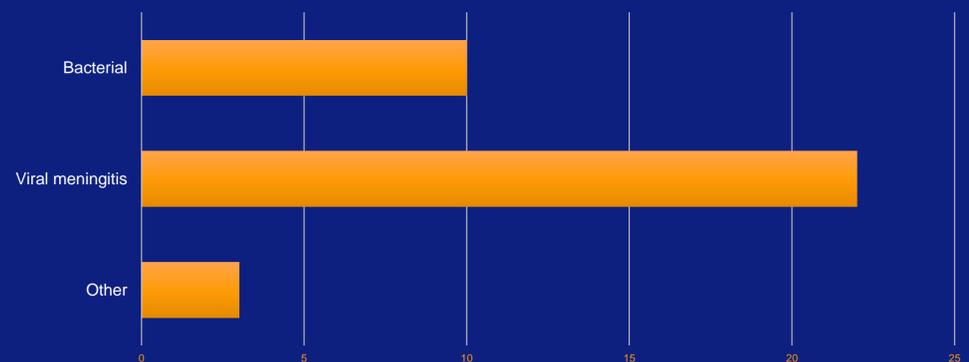
Aciclovir Use



Suspected diagnosis in patients who received aciclovir



Final diagnosis



## Discussion

This study demonstrates the further work that needs to take place to increase awareness and optimise treatment and investigations for patients with suspected meningitis. Appropriate early steroid use, reduced acyclovir use, fewer CT scans and earlier lumbar punctures are just a few points found from this study which would all improve the management of patients with suspected meningitis.

However all patients were treated with antibiotics appropriately and relatively promptly and overall mortality and morbidity rates were low. Saving time, money, reducing radiation exposure, shorter admission times and fewer neurological complications are all areas which stand to benefit from optimisation of care.

## Learning Points

- Lumbar Punctures should be conducted at the earliest available opportunity and should not be delayed unnecessarily.
- CT scans should only be conducted in those with a clear clinical.
- Fundoscopy should be attempted more to potentially facilitate this.
- Steroids should be used more in appropriate cases.
- Reduction in aciclovir use in patients without signs of encephalitis.
- LP burden should be other grades of doctor beyond just medical registrars.

## References

1. University Hospitals of Leicester Meningitis management and treatment guidelines
2. The UK joint specialist societies guideline on the diagnosis and management of acute meningitis and meningococcal sepsis in immunocompetent adults. McGill, F. et al. Journal of Infection, Volume 72, Issue 4, 405 - 438