

# Prevalence, Microbiological and Epidemiological Characterisation of Clinical Meningitis in Children

## Experience from Infectious Diseases Tertiary Referral Centre, Egypt

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### Introduction

Meningitis is a major cause of public health concern in developing countries, with high rates of morbidity and mortality. Early diagnosis and management helps improve outcome of disease. It also represents a resource and financial challenge in countries with limited resources. In this study we have undertaken a retrospective analysis of the microbiological and epidemiological characterisation of paediatrics patients admitted with meningitis to Alexandria Fever hospital (AFH), Egypt.

### Aim and Objectives

The aim is to identify the epidemiology of meningitis in local population, identify the current clinical practice and highlight areas for improvement. In addition, we aim to highlight best place to direct resources in order to improve disease outcome in the local population.

### Method

The study included retrospective analysis of data from 100 consecutive cases admitted to AFH during the period of January-December 2017 with a diagnosis of meningitis. Clinical data and lab results were collected from medical records after obtaining ethical approval. Patients aged 1 month -15 years were included. Exclusion criteria included patients with recurrent meningitis due to structural CNS defects, immunodeficient and asymptomatic patients.

### Results

During the study period, meningitis was more prevalent in males (75%) and was more in the younger age group of 1 month – 1 year (53%), and 31% were among 1 -5 years old children. The disease was more common in rural areas (62%), which is associated with lower socioeconomic status. The main route of patient admission was referral from Alexandria University teaching hospital (AUTH) representing 80% of the admissions and 17% were admitted directly through AFH A&E department. The main presentation on admission was fever (96%), toxic look (59%) vomiting (49%), convulsions (36%) and DIC (30%). Only 3 patients had rash on presentation. (Figure 1) CSF biochemical analysis was performed to all patients, while culture was performed only on patients admitted directly to AFH A&E (17%). Of the 17 CSF cultures, 15 samples were positive with a growth of *Neisseria Meningitidis* (6), *Streptococcus pneumoniae* (5), *Haemophilus influenzae* (4) and *Staph aureus* (1). (Figure 2)

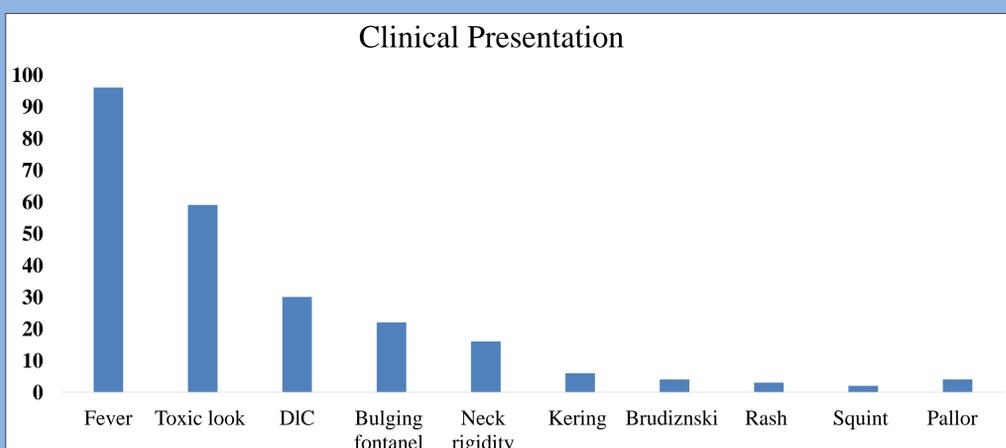


Figure 1: Bar Chart of the clinical presentation of meningitis cases admitted to AFH.

### Results

No virology PCR was performed on any of the CSF samples, however 6 of the patients were diagnosed as viral meningitis on clinical grounds. Isolation and infection control precautions were observed for the 6 patients with positive *N. Meningitidis* culture. All patients received an initial empiric treatment of IV Benzyl Penicillin and ceftriaxone. Acyclovir was added if viral meningitis was clinically suspected. Hospital length of stay averaged between 14-15 days for 68% of the patients, and 5% of the patients stayed in the hospital for more than 21 days. Complications included seizures (10%), hydrocephalus (2%), squint (2%) and subdural effusion (1%). (Figure 3) There was favourable outcome for 94% of cases with no mortalities, however 6% of the cases did not attend to their follow up appointments.

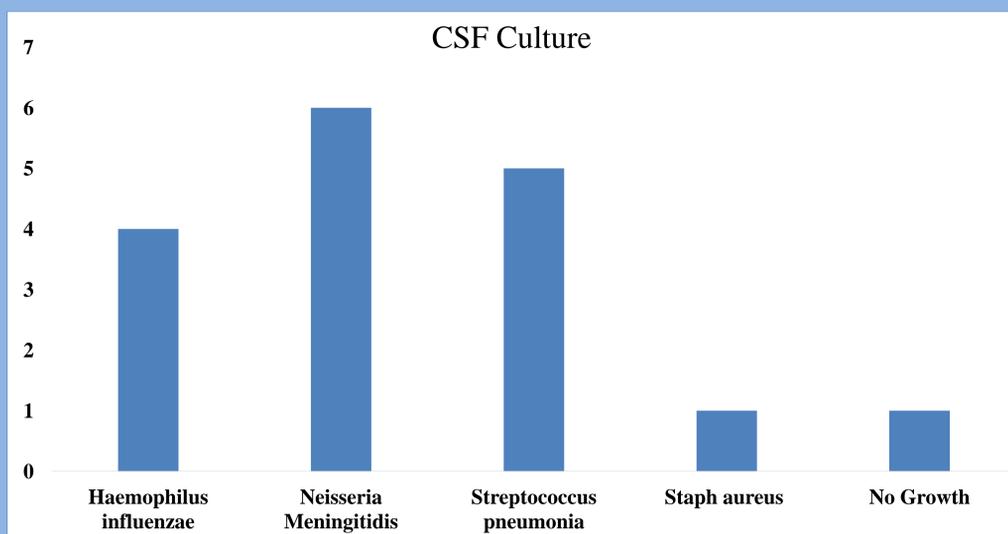


Figure 2: Microbiological culture results of the cultured CSF samples

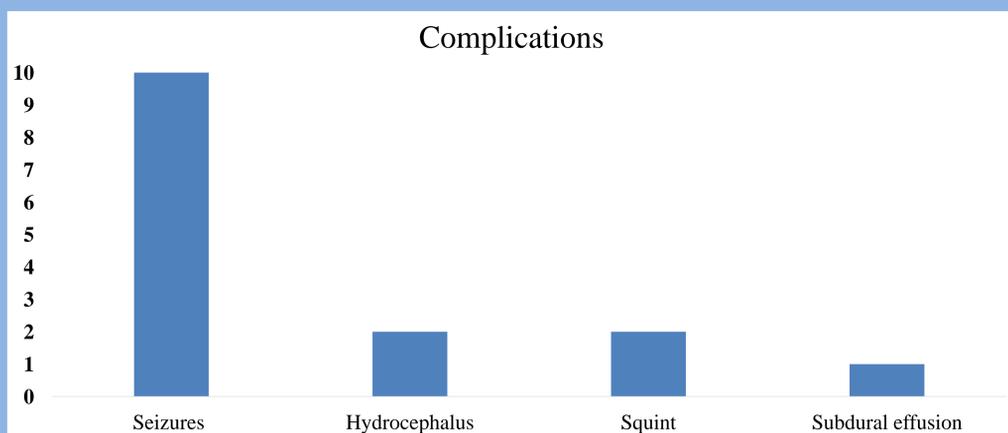


Figure 3: Complications of cases of Meningitis

### Discussion

Robust process for diagnosis and evaluation of cases of meningitis is required. More focus is needed in rural areas with limited resources, this includes improving healthcare facilities in addition to health education and raising public awareness of the disease.

Implementation of CSF microbiology culture for all cases of suspected meningitis as part of the initial assessment process is essential. A clear documentation of the culture and sensitivity results in patient's notes is important to help guide the treatment process and rationalise the antibiotic use.

There is minimal work done to identify the prevalence of viral meningitis in the local community. It is recommended that focus and resources would be directed to introducing a routine viral PCR on cases of suspected meningitis.