



Epidemiological Aspects and Seasonal Variation of Meningitis in Egyptian Patients: a Single-Center Study at Abbassia Fever Hospital from 2006 to May 2017

Thesis

*Submitted for Partial Fulfilment
of Master Degree in Tropical Medicine*

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2020

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سببنا أنك لا تعلم لنا
إلا ما علمتنا أنك أنت
العليم العظيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgment

*First and foremost, I feel always indebted to **Allah**, the Most Kind and Most Merciful.*

*I'd like to express my respectful thanks and profound gratitude to **Prof. Dr. Amany Ahmed Ibrahim**, Professor of Tropical Medicine, Faculty of Medicine, Ain Shams University for her keen guidance, kind supervision, valuable advice and continuous encouragement, which made the completion of this work possible.*

*I am also delighted to express my deepest gratitude and thanks to **Prof. Dr. Sara Mahmoud Abdelhakam**, Professor of Tropical Medicine, Faculty of Medicine, Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

*I am deeply thankful to **Dr. Amira Mahmoud AlBalakasy**, Lecturer of Tropical Medicine, Faculty of Medicine, Ain Shams University, for her great help, active participation and guidance.*

*I would like to express my hearty thanks to all **my family** for their support till this work was completed.*

Amr Mahmoud Hussein

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List of Abbreviations

Abb.	Full term
<i>ABM</i>	<i>Acute bacterial meningitis</i>
<i>AFB</i>	<i>Acid-fast bacilli</i>
<i>AIDS</i>	<i>Acquired immunodeficiency syndrome</i>
<i>AM</i>	<i>Acute aseptic meningitis</i>
<i>BM</i>	<i>Bacterial meningitis</i>
<i>CMV</i>	<i>Cytomegalovirus</i>
<i>CMV</i>	<i>Cytomegalovirus</i>
<i>CNS</i>	<i>Central nervous system</i>
<i>CRP</i>	<i>C-reactive protein</i>
<i>CSF</i>	<i>Cerebrospinal fluid</i>
<i>CSF</i>	<i>Collect cerebrospinal fluid</i>
<i>CT</i>	<i>Computerized tomography</i>
<i>DCL</i>	<i>Disturbed consiouness level</i>
<i>DIC</i>	<i>Disseminated intravascular coagulation</i>
<i>EBV</i>	<i>Ebstein-Barr virus</i>
<i>Hib</i>	<i>Hemophilus influenza type b</i>
<i>HSV</i>	<i>Herpes simplex virus</i>
<i>ICP</i>	<i>Intracranial pressure</i>
<i>IHMF</i>	<i>International Herpes Management Forum</i>
<i>IMD</i>	<i>Invasive Meningococcal Disease</i>
<i>INH</i>	<i>Isoniazid</i>
<i>IV</i>	<i>Intravenously</i>
<i>LCM</i>	<i>Lymphocytic choriomeningitis</i>
<i>LCMV</i>	<i>Lymphocytic choriomeningitis virus</i>

List of Abbreviations cont...

Abb.	Full term
<i>LP</i>	<i>Lumbar puncture</i>
<i>MC</i>	<i>Meningeal carcinomatosis</i>
<i>MMR</i>	<i>Measles-mumps-rubella vaccine</i>
<i>MOHP</i>	<i>Ministry of health and population</i>
<i>MR</i>	<i>Magnetic resonance</i>
<i>PAS</i>	<i>Para -aminosalicylic acid</i>
<i>PCV</i>	<i>Pneumococcal Conjugate Vaccine</i>
<i>PMNs</i>	<i>Polymorphonuclear leukocytes</i>
<i>PPV</i>	<i>Pneumococcal Polysaccharide Vaccine</i>
<i>PZA</i>	<i>Pyrazinamide</i>
<i>RIF</i>	<i>Rifampin</i>
<i>SAH</i>	<i>Subarachnoid hemorrhage</i>
<i>SC</i>	<i>Sickle-haemoglobin C</i>
<i>SM</i>	<i>Streptomycin</i>
<i>SPSS</i>	<i>Statistical program for social science</i>
<i>TBM</i>	<i>Epidemiology TB meningitis</i>
<i>TBM</i>	<i>Pathogenesis of tuberculous meningitis</i>
<i>TBRM</i>	<i>Tuberculous radiculomyelitis</i>
<i>VZV</i>	<i>Varicella-zoster virus</i>
<i>WHO</i>	<i>World Health Organization</i>

INTRODUCTION

Acute infections of the Central nervous system are among the most important problems in medicine, because early recognition, efficient decision making, and rapid institution of therapy can be lifesaving.

These distinct clinical syndromes include acute bacterial meningitis, viral meningitis, encephalitis, focal infections such as brain abscess and subdural empyema, and infectious thrombophilobitis. Each may present with a nonspecific prodrome of fever and headache. Key goals of early management are to emergently distinguish between these conditions, identify the responsible pathogen, and initiate appropriate antimicrobial therapy (*Roos & Tyler 2014*).

Meningitis is an inflammation of the protective membranes covering the brain and spinal cord. it is divided into acute and chronic meningitis. Acute meningitis is divided into a bacterial and viral infections. Injuries, cancer, certain drugs, and other types of infections, can cause meningitis (*Namani et al., 2014*).

The World Health Organization (WHO), estimates that there are around 1 million of cases per year worldwide with 135–200,000 fatal cases (*De Gans et al., 2010*). The commonest complication for meningitis was cardio respiratory failure followed by neurological sequelae (*Matthijs et al., 2015*)

Acute bacterial meningitis(ABM) is the most common form of suppurative CNS infections. The epidemiology of bacterial meningitis has changed significantly in recent years ,reflecting a dramatic decline in incidence of meningitis due to Heamophilus influenza, and a smaller decline in that due to Neisseria meningitides following use of vaccines for these organisms (**Foster and Rhoney, 2008**). Because of the high mortality rate, fast and accurate diagnosis and appropriate treatment are fundamental for a good outcome (**Salih et al., 2001**). A project performed by the Ministry of health and population (MOHP) in 2000 was carried out in 12 hospitals in Egypt (as Abbessia fever hospital) where S.pneumoniae was identified in(32%) of patients with ABM. and N. meningitides in(30%)Lastly,H. influenzae in(14.3%) (**Ministry of Health and Population, 2000**).

Aseptic meningitis. characterized by bacteriologically sterile cultures(Rotbart et al., 2010.).Incidence of aseptic meningitis in the US has been reported as 11 per 100,000 person-years, compared to 8.6 per 100,000 for bacterial meningitis, (**Khetsuriani, 2003**). It occurred in 15% of patients with mumps.Meningitis is more common in male than female patients (**Gupta et al., 2006**). In Egypt,viral meningio encephalitis was found to be the commonest type of meningitis followed by septic meningitis (**Fouad et al., 2015**).

Recurrent meningitis: two or multiple separate acute episodes of meningitis that are separated by a period of

convalescence and full recovery each of which is < 4 weeks in duration (*Adriani et al., 2012*).

Chronic meningitis: it is a chronic inflammation of meninges which can produce profound neurologic disability and may be fatal if not treated. The condition is most commonly diagnosed when a characteristic neurologic syndrome exist for >4 weeks and is associated with a persistent inflammatory response in CSF (cerebro spinal fluid) The causes are varied, the treatment depends on identification of the etiology (*Razonable et al., 2009*).

Meningism, is a set of symptoms similar to those of meningitis, caused by irritation of the meninges (*Matthij et al., 2015*) and should be differentiated from meningitis.

AIM OF THE WORK

To have an epidemiological profile of patients admitted with meningitis to Abbassia Fever Hospital from year 2006 to May 2017.

Chapter 1

INTRODUCTION TO C.N.S. INFECTIONS

Infectious diseases are a group of diseases which considered the main cause of morbidity and mortality in the developing world. Infections of the Central nervous system (C.N.S.), are the important problems in medicine, *because these* infections can cause dangerous complications. so early recognition, and rapid treatment, is very important (*Tunkel et al., 2015*).

The C.N.S. Infections include (*Tunkel et al., 2015*):

- Meningitis: Inflammation of the meninges, which are the membranes surrounding the CNS, to protect the brain and spinal cord, This inflammatory process extends throughout the subarachnoid space of the brain and the spinal cord and involves the ventricles.
- Encephalitis: Inflammation of the brain cells.
- Focal infections: eg. brain abscess and subdural empyema.
- *Myelitis*: the spinal cord inflammation.