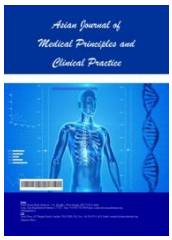

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An Epidemiological Profile of Meningitis and Encephalitis in Adults Admitted to Benghazi Medical Centre in 2018

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Authors' contributions

This work was carried out in collaboration among all authors. Author NH designed the study, performed the statistical analysis, wrote the protocol, managed the literature searches and wrote the first draft of the manuscript. Author ABY managed the analyses of the study. Authors HEZ and AEZ supervised the study and data collection. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To describe epidemiological profile with respect to demographics and seasonal variations in occurrence of Meningitis, Encephalitis and Meningoencephalitis.
Methods: A retrospective review of medical records of meningitis and Encephalitis and *Meningo-encephalitis* cases from 1st January 2018 to 31st December 2018 from Medicine department at Benghazi Medical Center in Benghazi city, Libya. All patients meeting the case definition were included .Data were collected using questionnaire on demographics including, age, sex, Address, and date of admission and date of discharge, diagnosis.
Results: From January to December 2018, 31 cases were identified, the mean age of all cases was (41.2) years. There were 20 (66.7%) of them males and 10 (33.3%) were females. The

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proportion of diagnosis of meningitis, encephalitis, and Meningoencephalitis was (22.6%), (25.8%), (51.6%) respectively. Differences were observed in the occurrence of each infection during the year seasons.

Conclusion: Based on data obtained, most infections occured in older age with gender differences in each type of infection. Seasonal variations noticed in all infections. This descriptive study was used as a screening tool to track cases and further larger epidemiological study is needed in order to plan effective preventive and surveillance measures.

Keywords: Meningitis; encephalitis; neuro epidemiology; seasonality.

1. INTRODUCTION

Meningitis and Encephalitis are infectious diseases of central nervous system caused mainly by bacteria and virus. The infection begins somewhere else in the body besides the brain, like ears, sinuses, or throat. Meningitis and encephalitis may co-exist (as meningo-encephalitis) or share symptoms and aetiologies [1]. These medical emergencies may pose high morbidity and mortality rate especially when the inflammation affects the brain and its membranes [2]. Bacterial meningitis can be life-threatening and cause brain damage, while viral meningitis tends to be less severe [1]. In contrast, the majority of viral encephalitis have an unknown cause, and may lead to adverse health outcomes [3]. There are a number of risk and prognostic factors, depending on the pathogen causing the infection. The environmental factors play a curial role in epidemiology of such infections [4].

A growing body of literature in descriptive epidemiology of infectious disease has demonstrated the seasonal pattern of CNS infections. Comprehensive understanding of the environmental factors impacts on the biology and ecology of the causative agent is needed to accurately measure the seasonal dynamics of theses infectious diseases [5,6].

The study of epidemiological pattern of neuroinfections by time can determine whether there has been an increase or a decrease of disease over time, besides both geographic and demographic factors and the epidemiologic trade of CNS infections [7]. Consequently, the application of epidemiological concepts in studying the neurologic infections contributes to early detection and diagnosis of disease and may improve the prognosis meningitis, encephalitis or meningeoencephalities [8].

Yet, recent published studies that investigate the aetiology and epidemiology of CNS infections in developing countries are limited [9]. Despite advances in vaccinations, meningitis, encephalitis and menngeoencephalities are still reported in all age groups. The other concern is represented in the absence of an electronic medical reporting system. Many questions remain about the distribution of CNS infections. In this study, we attempted to get insight on the epidemiological picture of diseases based on available data from Benghazi medical centre, which serving the area in the east of Libya.

The overall aim of this study was to describe epidemiological profile with respect to demographics and seasonal variations in occurrence of Meningitis, Encephalitis and Meningo-encephalitis.

2. METHODS

A cross sectional study was conducted using retrospective review of medical records of meningitis and Encephalitis and Meningo-encephalitis cases from 1st January 2018 to 31st December 2018 from Medicine department at Benghazi Medical Center in Benghazi city, Libya. Data collected on 31 Libyan patients, aged 16–87 years.

2.1 Data Collection Tools

Data were collected using questionnaire on demographics including, age, sex, Address, and date of admission and date of discharge, diagnosis (Meningitis, Encephalitis, and Meningio-encephalities).

2.2 Statistical Analysis of the Data

Data entry and analyses was using SPSS software package version 16. Qualitative data were described using number and percent. Quantitative data were described using, mean, and standard deviation.

3. RESULTS

A total of 31 cases was identified from all admissions during 2018. The mean age of all

cases was 41.2 years as Fig. 1 shows. Age distribution according to type of infection is described in Fig. 2.

Regarding the gender of cases, 20 (66.7%) of them were males and 10 (33.3%) were females. Sex was unrecorded for 1 case. From the studied 31 cases, a diagnosis of meningitis was in 7 cases (22.6%), and 8 cases, (25.8%) of them diagnosed with encephalitis. while the majority of cases were diagnosed as meningeo-encephalities (16 cases) (51.6%). Fig. 3 summarises the gender distribution of cases in each type of infection.

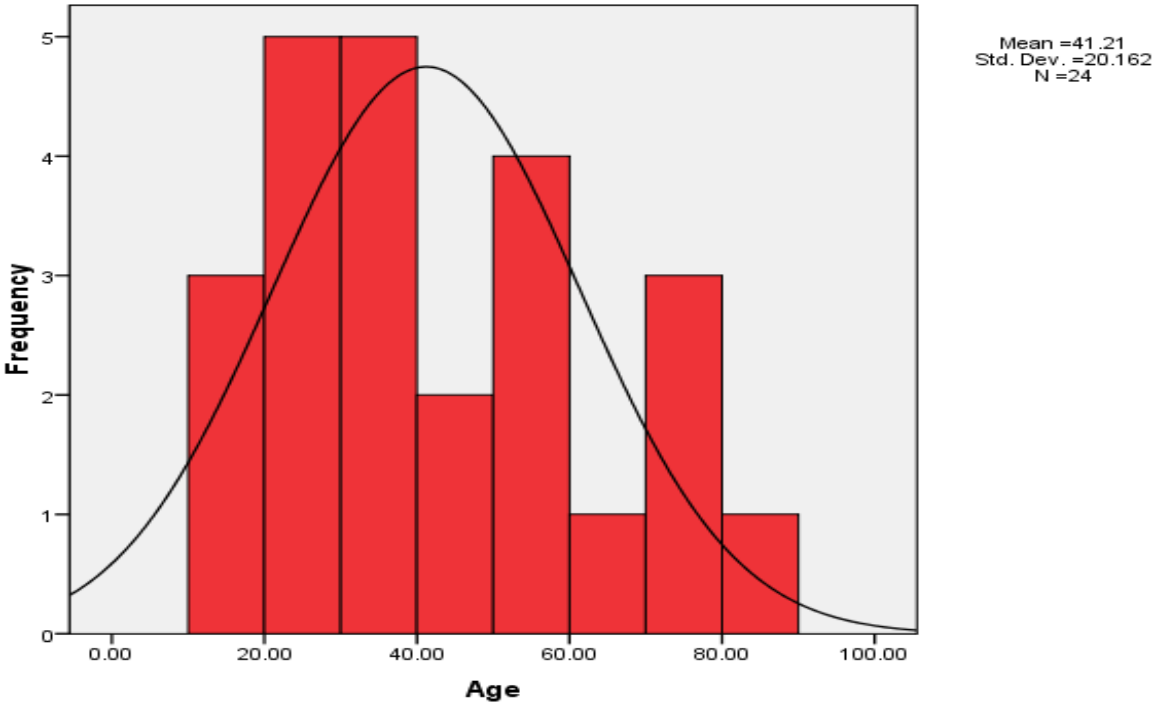

Fig. 1. Age distribution of the studied cases

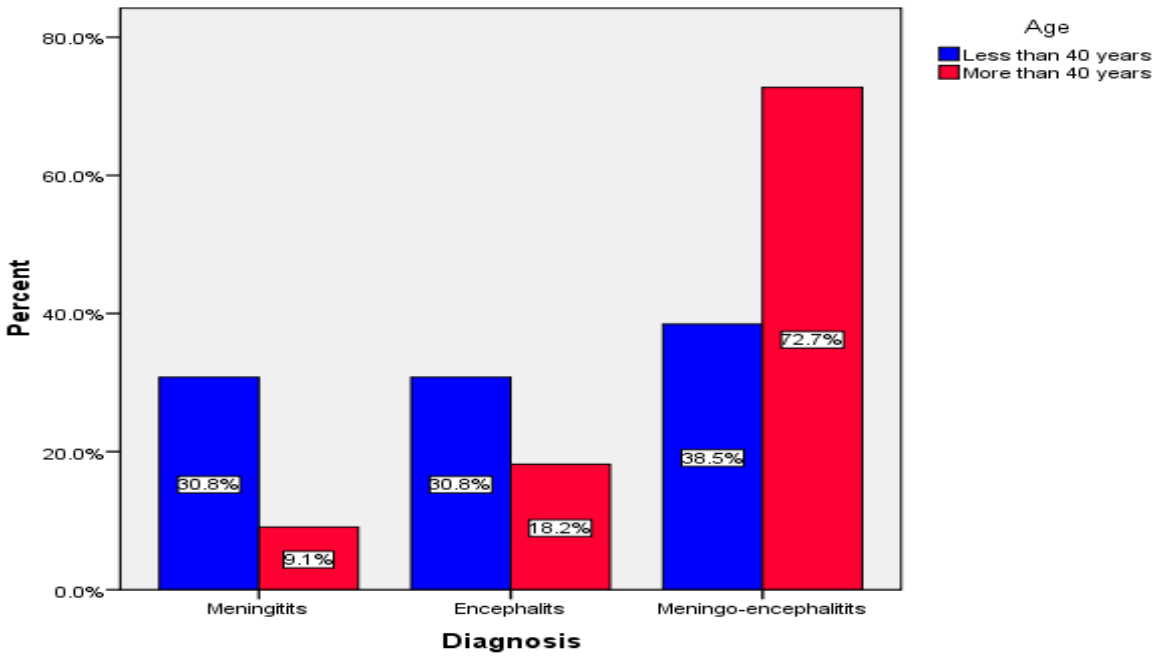

Fig. 2. Age distribution according to type of infection

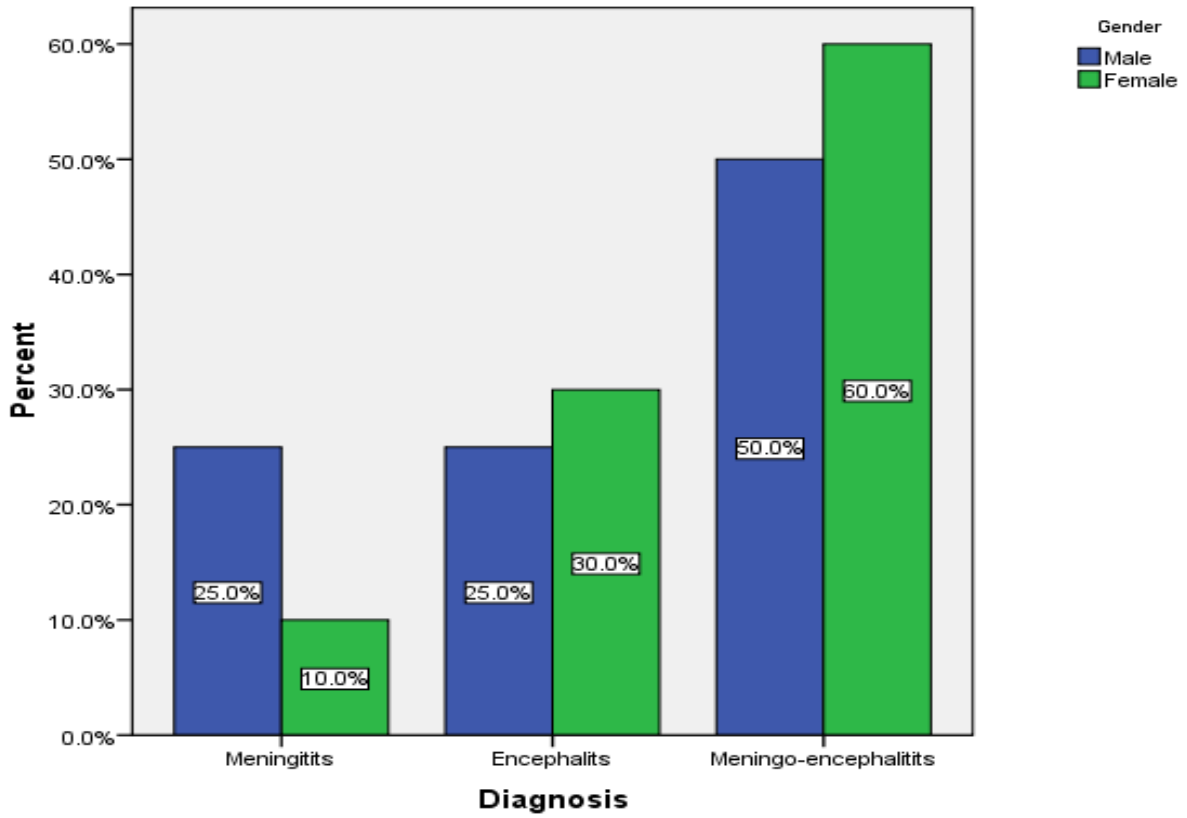

Fig. 3. Gender distribution of cases according to type of infection

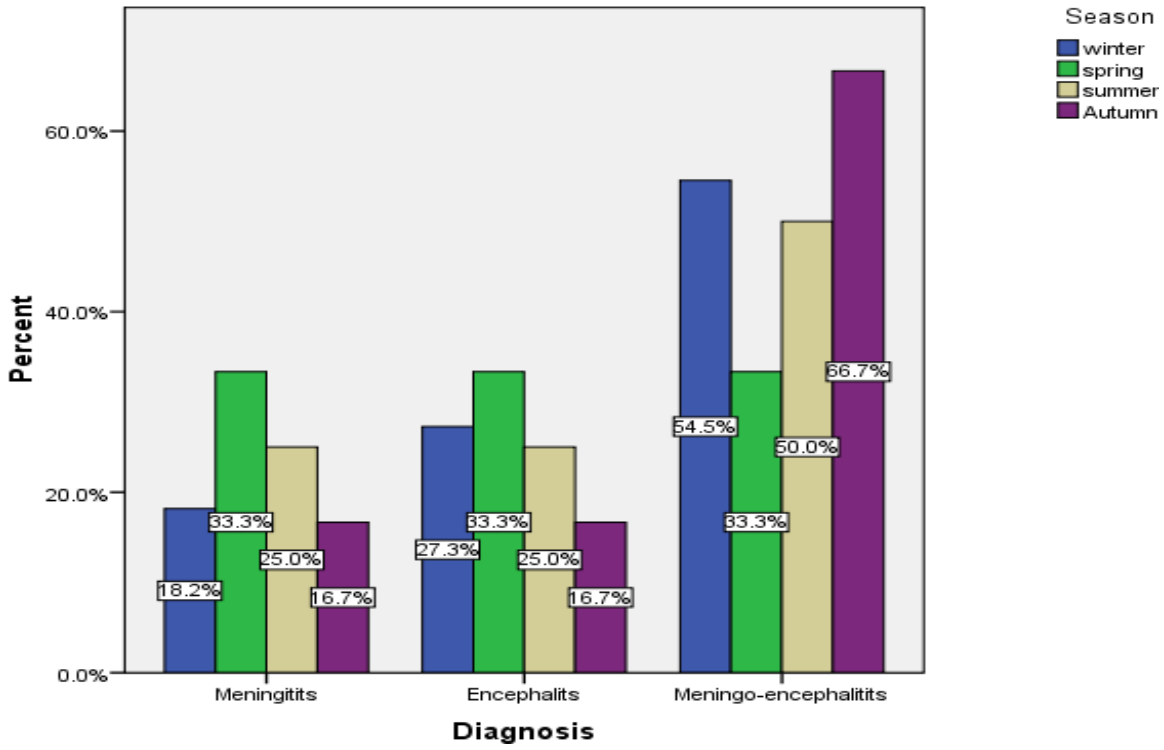

Fig. 4. Seasonal variations in each type of infection

In terms of seasonal variations, there were differences were observed in the occurrence of each infection during the year seasons. Fig. 4 summarises the seasonal variations in each type of infection.

4. DISCUSSION

The result show small number of cases of meningitis, encephalitis and meningo-encephalities during the year 2018 in Benghazi Medical Centre. However, there may be other cases underestimated have had access to other medical private or public centre in Benghazi. Since there is no medical data bases for health system and medical records in Benghazi and this limit our estimation of cases in that period.

In the present study, among 31 cases, the majority of cases were in age older than 40 years .this was comparable to a study done in Egypt found a significant effect of older age in patients diagnosed with these diseases [10]. In addition, a prospective study in the UK found a strong evidence of higher incidence of encephalitis in older age [11]. This was reported elsewhere [12,13].

According to type of infection we observe little differences between males and females. In meningitis, the male were higher than female. Likewise approximate findings reported from a study done in the USA demonstrated that meningitis in male adults differs significantly from female adults [14]. Same gender deference in meningitis and encephalitis was observed in other studies [10,15]. Generally, several researchers found sex as a major risk determinant of infectious diseases [16].

The present study observed seasonal variation in meningitis, encephalitis and meningo-encephalities. This was also reported in other studies [17,18]. Egyptian study found Meningitis and encephalitis cases were found to peak during the summer months [10,19].

In light of literature on countries out side the meningitis belt, various seasonal patterns of bacterial meningitis was reported [20,21].

Regarding Encephalitis, previous epidemiological reports found highest incidence in summer [22]. The researchers suggested an environmental factor effect regarding humidity and temperature [23]. Summer peak was also noticed in Meningo-encephalitis or as known encephalomeningitis [24].

5. STUDY LIMITATION

Data quality was the first concern, as it was missing on importance epidemiological dimension, which is the place of residence. Furthermore, the Small sample size and incomplete medical files regarding accurate laboratory data that may help to categorise the CNS infections according to pathogen and get further explanations.

6. CONCLUSION

In conclusion, based on data obtained, we found that most infections occur in older age with gender differences in each type of infection. Seasonal variations noticed in all infections. This Descriptive cross sectional study design was used as a screening tool to track cases and further larger epidemiological study is needed in order to plan effective prevention and surveillance strategies.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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