Journal of Health, Medicine and Nursing
ISSN 2422-8419 An International Peer-reviewed Journal
Vol.42, 2017

Reported Cases of Adult Viral Meningitis in Al-Yarmouk Teaching Hospital over Five years Interval

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Abstract
Background: Acute meningitis is a medical emergency with a potential for high morbidity and mortality. Viral meningitis is characterized by acute onset of fever, headache, photophobia, and neck stiffness, often accompanied by nausea and vomiting. Spontaneous recovery is usual in viral meningitis.**Patients and Methods:** A descriptive case series study. A special medical forma arranged for each patient suspected with meningitis for data collection.**Results:** The total study sample was 66 patients. Male were (53%) and (47%) were female, with a ratio of male to female 1.13:1. The mean age was 42+18.7. A peak number of cases 17(26%) was in the year 2015. While the lowest number of cases 5% was reported in the year 2011. Patients had associated systemic conditions forming 15(23%) of total patients. Nine patients died out of the total 66 patients with a mortality rate of 14%.**Conclusion:** Most of cases were in the old age group because of antibiotic abuse and increased prevalence of concomitant chronic diseases. Reported cases of meningitis increased in the year of emigration of large number of population after ISIS invasion in 2015, and in 2013 due to H1N1 virus outbreak.
Keywords: Viral meningitis, chronic diseases, photophobia

Introduction

Viral meningitis is the most common cause of aseptic meningitis, (1) It is a medical emergency with a potential for high morbidity and mortality (2). Viral meningitis is an inflammation of the meninges with an abnormal number of cells in the cerebrospinal fluid (CSF) (3).

During the initial evaluation of a patient with suspected meningitis. Blood cultures should be obtained, prior to prompt initiation of empiric antimicrobial therapy (4). The key to the diagnosis of meningitis is the CSF examination (5). The analysis of cerebrospinal fluid is essential in order to distinguish viral from bacterial meningitis. As the clinical picture of both are similar (3) (6).

Viral meningitis is characterized by acute onset of fever, headache, photophobia, and neck stiffness, often accompanied by nausea and vomiting (7). Sometimes neck stiffness and photophobia may also be absent in adults (8). In most cases, viral meningitis runs a mild course and is a self-limiting, often transient illness (1). Spontaneous recovery is usual in viral meningitis (3).

Enteroviruses are said to account for most of cases in adults (3), but a wider range of causes is increasingly implicated: herpes simplex virus type 1&2, varicella zoster virus, Human immunodeficiency virus (HIV) and Epstein-Barr virus (9).

This retrospective study conducted to describe the characteristics, and outcome of viral meningitis in adults admitted to Al-Yarmouk hospital.

Patients and Methods

A descriptive case series study conducted in Al-Yarmouk teaching hospital. A special medical forma arranged for each patient suspected with meningitis. The forma was filled in with sociodemographic information and relevant clinical notes. Data were collected from revision of these forms. This revision cover all CSF-proved viral meningitis from Sep 2011 through Sep 2016. The data groups analyzed and presented in a pie and bar graphs. Chi-square test was used to explore the relationship between variables. P-value of 0.05 and less were considered as significant.

Results

The total study sample was 66 patients. Male were (53%) and (47%) were female, with a ratio of male to female 1.13:1 as shown in Figure -1.

The mean age of the sample was 42+18.7. Old age group forming the largest one 25(38%), followed by the young age group 23(35%), and the least one was those patients with middle age group 18(27%) (Fig-2).

Figure-3 represents the five years' time line of viral meningitis cases reported in our hospital. With a peak number of cases 17(26%) was in the year 2015. While the lowest number of cases 5% was reported in the year

2011.

Figure-4 revealed that 15(23%) of the patients had associated systemic conditions (DM, NHL on chemotherapy, stroke, heart failure). Ten patients out of these 15 patients (66.6%) with associated diseases were in the old age group (51 and more). While There was a significant relationship between presence of concomitant diseases and age groups (P= 0.013) (Table-1).

Nine patients died out of the total 66 patients with a mortality rate of 14% (Fig-4). The mortality rate distribution according to age group was shown in table 2, which indicate that the highest mortality rate 22% was among the middle age group (31-50), The relationship of mortality rate and age group was not significant (P= 0.231).

Discussion

Since viral meningitis is most common in young children (9). Therefore, the cases in this study were low because it covers the adult patients only.

Male to female ratio in this study differs than Al-Mahdawi *et al* study in 2016 where five patients out of 12 (42%) occurred in male patients and seven patients out of 12 (58%) occurred in female patients (9).

In this study, the majority of patients were old age group probably because of decreasing immunity with age as part of aging process {R}. Antibiotic abuse being prescribed to even simple upper respiratory tract infection and the easy way to get these drugs by people and the liberal antibiotic usage cause increasing rate of viral meningitis on the expense of bacterial meningitis. Besides, old patients in the sample have multiple systemic disease like poorly controlled diabetes mellitus, stroke, and general ill health due to unhealthy eating habits and sedentary lifestyle making them vulnerable to infections including CNS infection. According to Bartt (2012), the risk of clinical diseases and mortality from meningitis is increased with Immuno-globulin deficiency, sickle cell disease, alcoholism, diabetes, and off leaks (10).

Our study showed that 23% of the patients were associated with other systemic diseases like uncontrolled diabetes mellitus, non-Hodgkin lymphoma with chemotherapy, heart failure and stroke; of those patients 66.6% fall in the old age group (51 & more) this may explain the higher percentage of patients with meningitis that fall in this age group.

Number of reported cases of meningitis increased in 2015 this may be attributed to emigration of large number of population to safer area after ISIS invasion. Other factors such as poor hygienic life, unsafe water supply, and poor diet in the displaced campaign. Another peak was in 2013 this may be related to outbreak of H1N1 virus in this year proved by other study done by Hayyawi *et al* 2016 in our hospital (11).

The respiratory viruses (Influenza A & B) adenovirus and rhinovirus can occasionally cause meningitis (12).

Conclusion

Most of cases were in the old age group because of antibiotic abuse and increased prevalence of concomitant chronic diseases. Reported cases of meningitis increased in the year of emigration of large number of population after ISIS invasion in 2015, and in 2013 due to H1N1 virus outbreak.

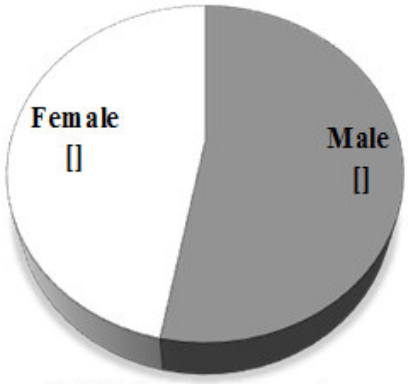

figure 1: Distribution of sample according to sex

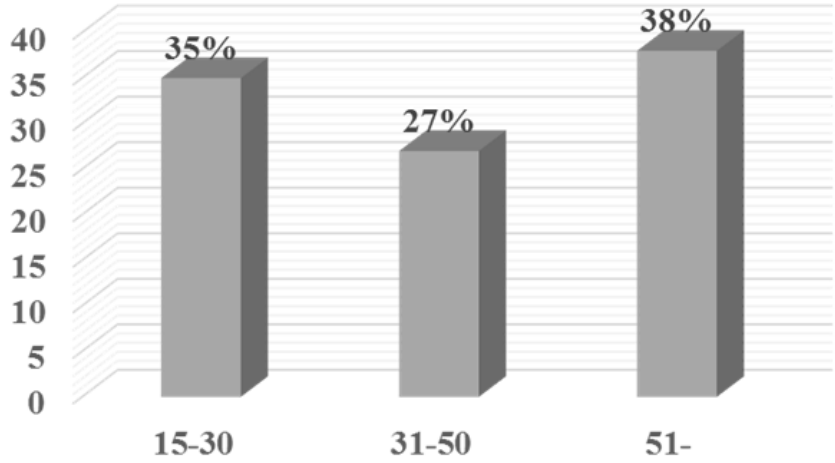

Figure 2: Distribution of sample according to age groups.

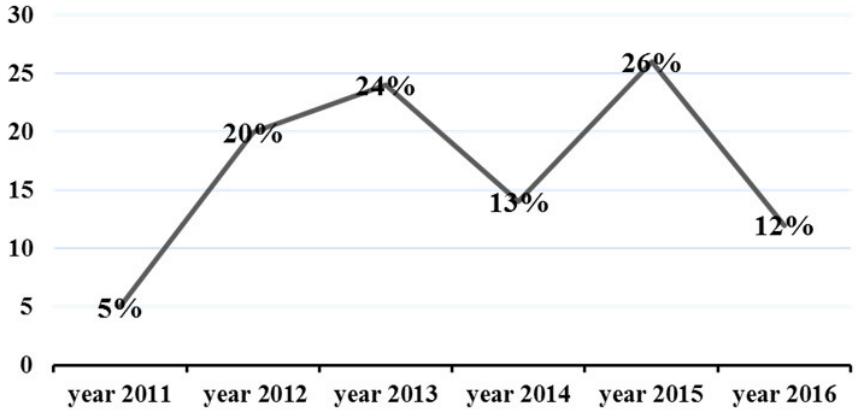

Figure 3: Time line of meningitis over six years

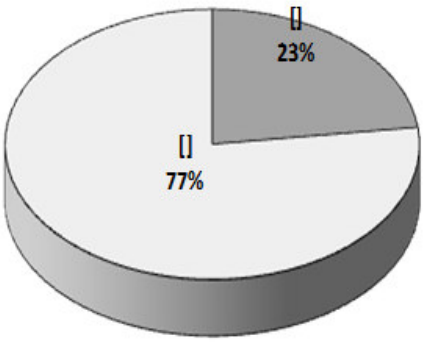

Figure 4: Having Associated diseases

Table 1: Distribution of meningitis associated with chronic diseases according to age groups

Age group	Associated disease			Chi-square test
	Yes*	No	Total	
	No (%)	No (%)	No (%)	
15-30	1(6.6)	22(43.1)	23(35)	$\chi = 8.673$
31-50	4(26.6)	14(27.3)	18(27)	P = 0.013
50-	10(66.8)	15(29.4)	25(38)	
total	15(100)	51(100)	66(100)	
* (DM, NHL on chemotherapy, stroke, heart failure)				

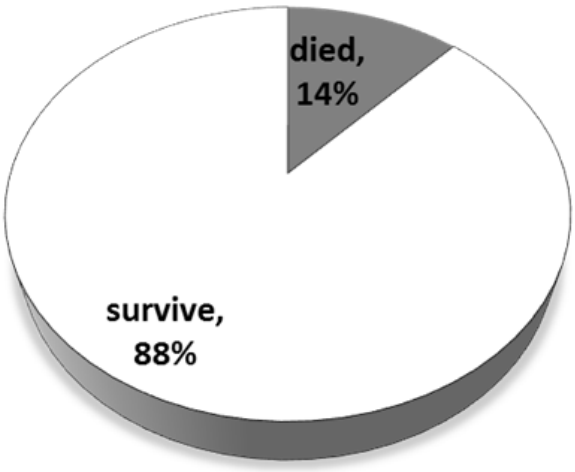

Figure 5: Death rate

Table 2: Distribution of dead according to age groups

Age group	Death rate			Chi-square test
	Yes	No	Total	
	No (%)	No (%)	No (%)	
15-30	1(4)	22(96)	23(100)	$\chi = 2.930$
31-50	4(22)	14(78)	18(100)	P = 0.231
50-	4(16)	21(84)	25(100)	
total	9(14)	57(86)	66(100)	

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