

Survey Study for Causative Agents of Meningitis Patient in Babylon Province

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Abstract

One of the most dangerous infections that cause elevated morbidity and mortality rates is meningitis. Meningitis in children is one of the life threatening condition in pediatric age group, which needs proper and early diagnosis in the emergency department. According to findings and clinical diagnosis (35.3%cases) considered bacterial while (64.7% cases) considered non bacterial meningitis. Most rate of infection of meningitis occurred in 2017 (38.3%),Male sex, Age< 1 year with a higher prevalence of meningitis. We concluded that Bacterial meningitis are still occupying large percentage of cases admitted to hospital, and if un-diagnosed promptly will have a high mortality.

Key words : meningitis, survey,epidemiology, Babylon

Introduction

Meningitis is a subarachnoid space infection It appears to be a significant source of morbidity and mortality caused by a variety of pathogenic organisms^[1]. It may have infectious causes, such as, or may be infected with, bacteria, mycobacteria, viruses, fungi, or parasites. drug reactions, cancer, or autoimmunity^[2]. Bacterial meningitis are considered as one of the most serious infection in infant and children, Which, if not diagnosed and treated early, causes multiple complications and high mortality.. Early diagnosis, therefore,, early implementation Appropriate and important antimicrobial Therapy is important to prevent further treatment. complication untreated bacterial meningitis is highly lethal, leaving patients with serious neurological sequelae and impairing the lives of children^[3,4]. Analysis of the CSF is critical to the diagnosis of meningitis and the Bacterial distinction from other etiologies., Other indications for CSF

research include Guillain Barré syndrome diagnosis, other demyelinating mechanisms, and, diagnosing Care, and pseudo tumor cerebral^[5]. Acute bacterial meningitis is serious with a high rate of fatality^[6]. Viral and bacterial meningitis can put a tremendous strain on families, cultures, and communities^[7]. While recurrent intellectual disability Often has been linked with bacterial meningitis, Some viral pathogens have also been identified, such as parechovirus, linked to impaired developmental achievement^[8]. For this reason bacterial meningitis needs empiric treatment with appropriate potent antibiotics to avoid fatality. The empirical antibiotic regimens should be updated periodically to overcome the development of antimicrobial resistance. The combination of vancomycin with either ceftriaxone for adults or cefotaxime for pediatric ages is given empirically for those with suspected bacterial meningitis, based upon susceptibilities of isolated pathogens^[9,10].

This study was carried out to describe the epidemiology of different types of meningitis and variables affecting the outcome.

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Methodology

A retrospective study carried out in Babylon, Iraq Babylon hospital for Maternity and Children from January 2016 to December 2018. Total sample 461 pateint , The short-form was designed to record the personal information of the study sample as age(below>1 year,1-2,2-3,3-4,4-5,5-6,>6 yr) gender (male or female), The distribution of patients according year of infection

, distribution of patients according cause of meningitis including viral or bacterial.

Results and Discussion

The results show that the incidence of **meningitis** in relation population was found to be different between reported age groups. Maximum group noted in age (low one year) at (49.5%) and minimum group note in age of (3-4 years)at(4.8%) just mention in figure one

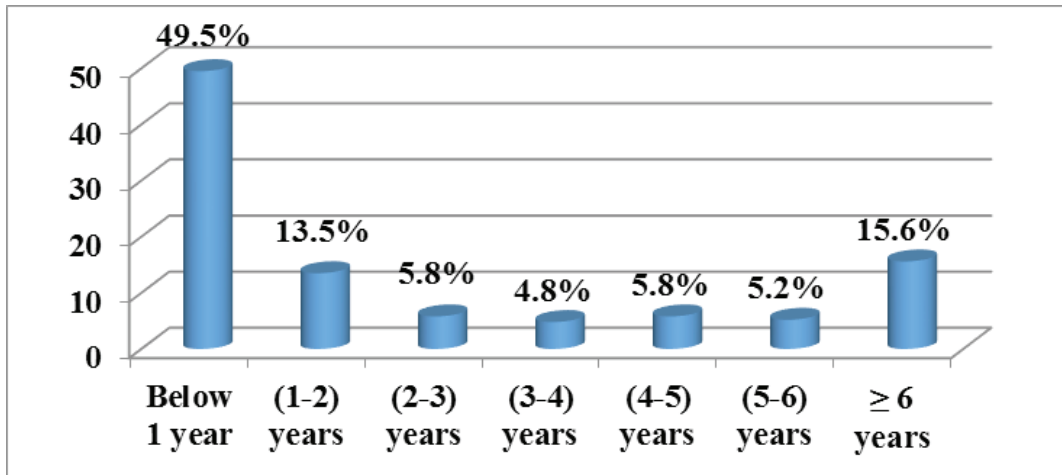


Figure 1: The distribution of patients according age

The incidence of neonatal meningitis is approximately (n=462). in age(low one year) at (49.5%) Compared to the global incidence of meningococcal in Iraqi children and increased to (15.6 percent) in the age group > 6 years , in addition to the possible emergence of new serogroups and the potential increase in the incidence of this bacterium, which needs more responsive techniques^[11] .our results showed Age <1 year was found high infection with meningitis Some viral pathogens have also been identified, such as

parechovirus^[12]. prevalence of meningities was more (59.6%) in the age group of 2 months to 12 months of age in accordance with study by ^[13] Prevalence rate amongst below one-year age group has been reported as 77%, 65% and 75% and 61% by various authors.

Meningitis is caused by a large variety of bacteria^[14]. The results exhibited distribution of patients according gender. Majority (64.5%) of patients was male. (n=462),while 36.5%) was female.

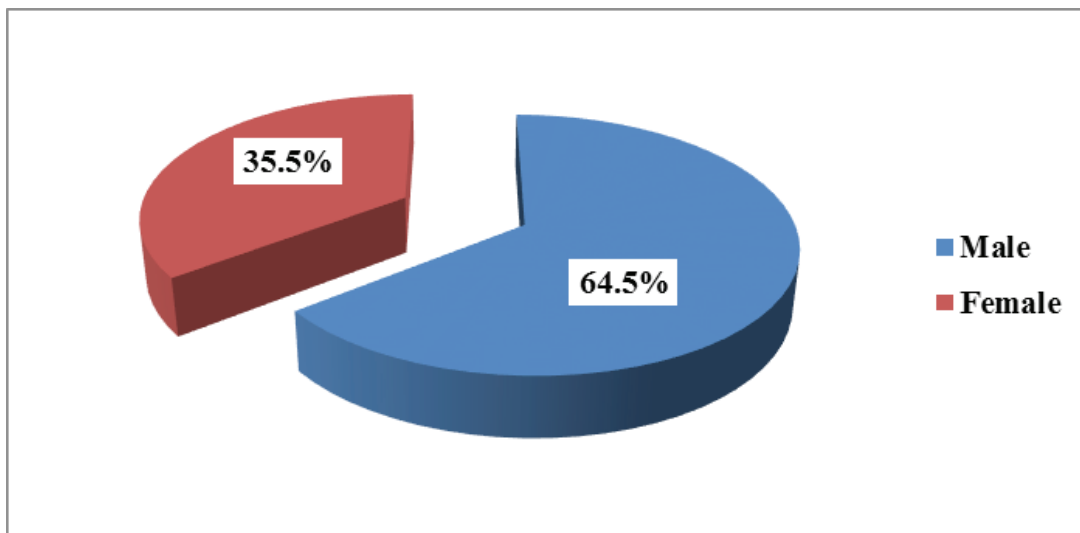


Figure 2: The distribution of patients according gender

The current results semi agreed with study of^[15] who found that that 65 (68%) of cases were male, while 31 (32%) of cases were female in the ratio of (2:1). A male preponderance of 1.27:1, 1.2:1 and 1.07 was also seen in other studies conducted in Iran/Tehran metropolitan area with a 2:1 ratio, (Mosavi-Jarrahi et al, 2009)^[16] and other research respectively, There are poorly understood reasons underlying these sex differences, but a hypothetical model It has been designed to increase vulnerability to infectious diseases. Diseases such as relative immune deficiency^[17].

The research results agreed also with (Mahmood, 2019)^[18] who find that 73 patients (62.4 percent) were male and 44 patients (37.6 percent) were female with a male to female ratio of 1.65:1. No important prognostic factor P value 0.233 was found with regard to the prognostic factors male gender. Kooman *et al* discovered an important prognostic factor P value of 0.018^[12].

The results of present study explained the distribution of patients according year of infection. Majority (38.3%) of patients infected during 2017. (n=462).

The rate of infection It is estimated that meningitis has fallen globally by 21.0 percent from 1990 to 2016^[19]. This indicates that the development of meningitis will be much faster^[20]. The present study exhibited also the distribution of patients according month of infection. Majority (13.9% and 13.4%) of patients infected during august and October respectively. (n=462).

Interestingly, throughout the seasonal period, an overall latitudinal trend could be seen, but latitudinal differences preclude a full quantification of this pattern. Second, the seasonal timing of bacterial meningitis was between February and March, during the dry season, in all African meningitis belt countries (between -5 ° N and 20 ° N).. Third, the incidence of disease caused by any of the pathogens peaked in countries below -20 ° N (South America, Oceania, and South Africa) from June to July (winter season)^[21].

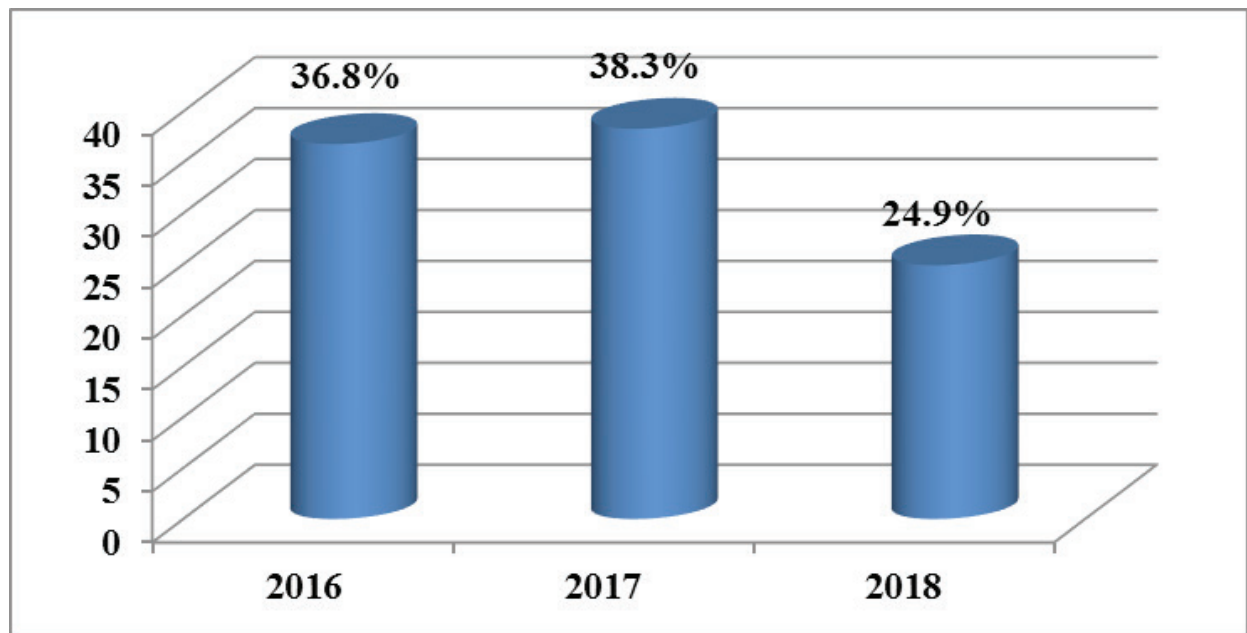


Figure 3: The distribution of patients according year of infection

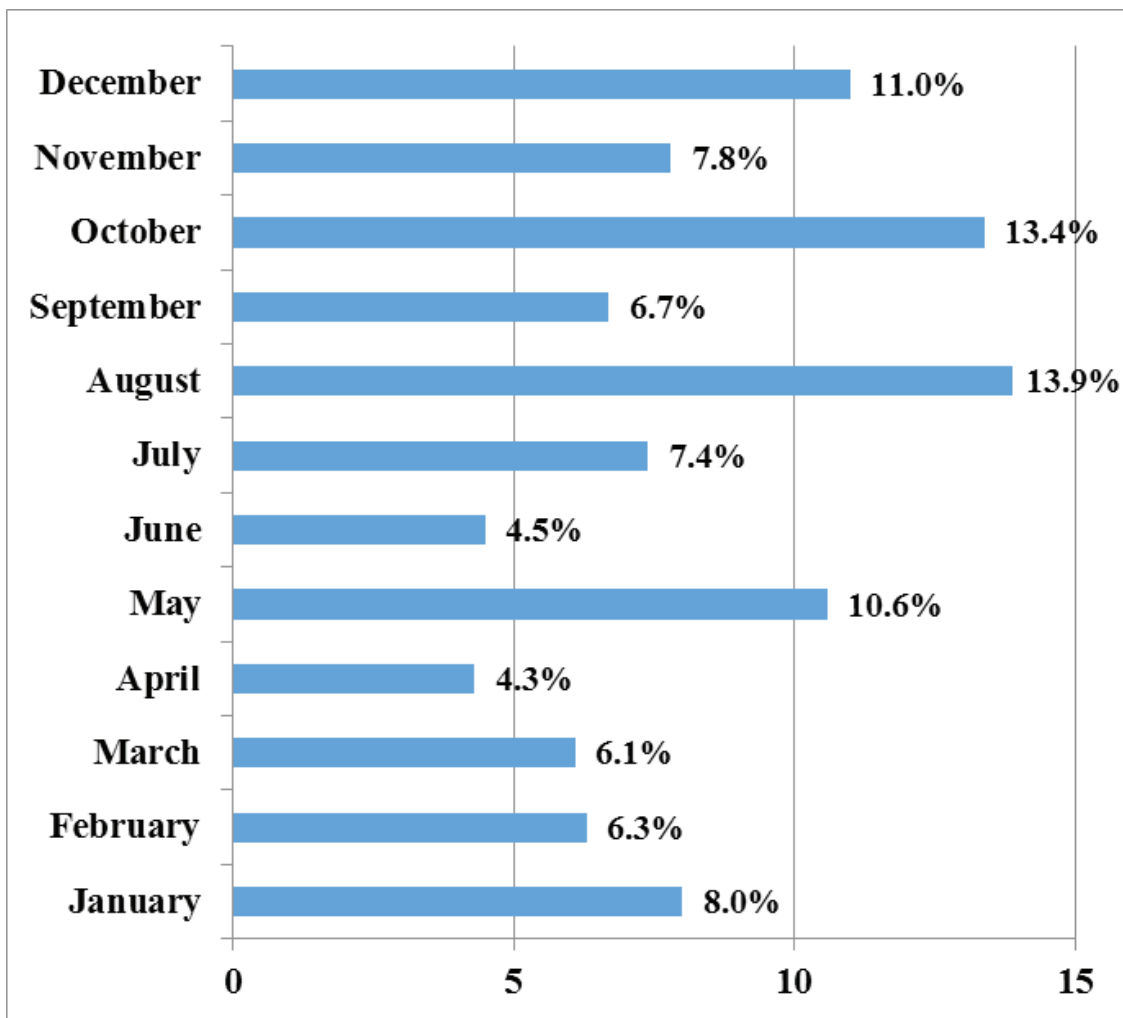


Figure 4: The distribution of patients according month of infection

To encourage the awareness of global seasonal trends in bacterial meningitis, we performed an observational, time-series study^[22]. When considering the paradigm of the host-pathogen-environment and recognizing the multipart and nuanced collaboration Among these variables, we may be able to hypothesize A possible association between climate and the seasonality of bacterial meningitis over a wide geographical range is

indicated by the latitudinal pattern^[23].

The results of present study show the distribution of patients according cause of meningitis including viral or bacterial. Viral meningitis represent (64.7%) of patients and link between cause of meningitis and study variables including (age, gender, and year of infection and months of infection).just mentions in figure 5 and table 1 below

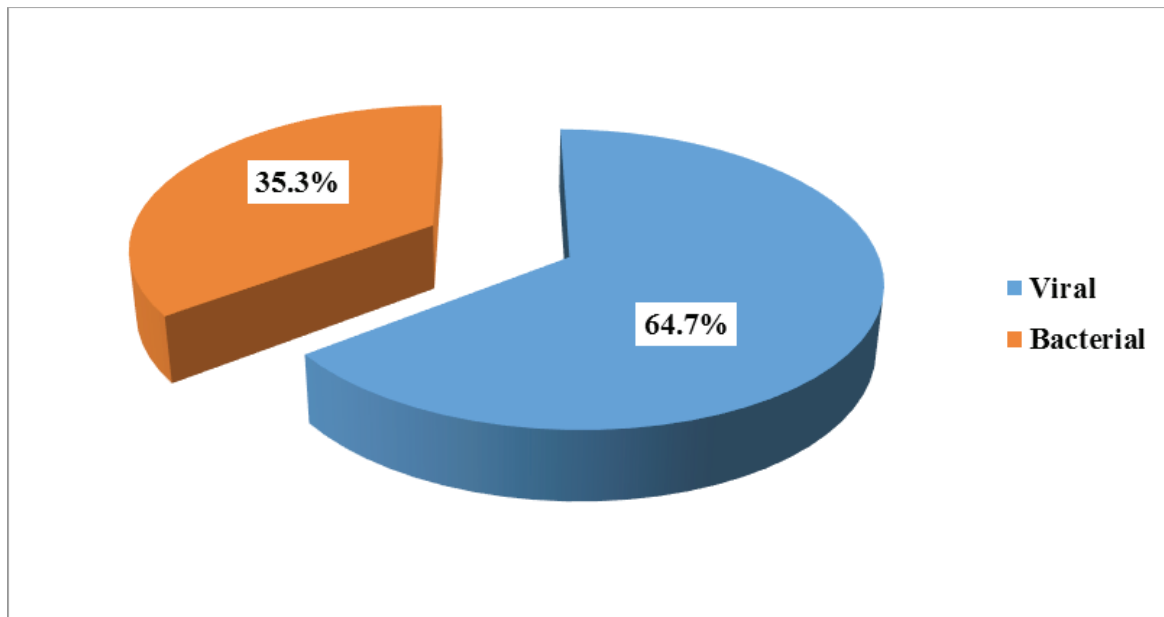


Figure 5: The distribution of patients according cause of meningitis

Table 1: The association between cause of meningitis and study variables

Study variables	Cause of meningitis		Total	X2	P-value
	Viral	Bacterial			
Age					
Below 1 year	148 (49.6)	80 (49.1)	288 (49.4)	2.819	0.42
(1-3) years	62 (20.7)	27 (16.6)	89 (19.3)		
(3-5) years	33 (11.0)	16 (9.8)	49 (10.6)		
≥ 5 years	56 (18.7)	40 (24.5)	96 (20.7)		
Total	299 (100.0)	163 (100.0)	462 (100.0)		
Gender					
Male	187 (62.5)	111 (68.1)	298 (64.5)	1.422	0.233
Female	112 (37.5)	52 (31.9)	164 (35.5)		
Total	299 (100.0)	163 (100.0)	462 (100.0)		

Cont... Table 1: The association between cause of meningitis and study variables

Year of infection					
2016	102 (34.1)	68 (41.7)	170 (36.8)	3.431	0.18
2017	123 (41.1)	54(33.1)	177(38.3)		
2018	74 (24.8)	41 (25.2)	115 (24.9)		
Total	299 (100.0)	163 (100.0)	462 (100.0)		
Month of infection					
1-3	57 (19.1)	37 (22.7)	94 (20.3)	5.876	0.118
4-6	52 (17.3)	38 (23.3)	90 (19.5)		
7-9	83 (27.8)	46(28.2)	129(27.9)		
10-12	107 (35.8)	42 (25.8)	149 (32.3)		
Total	299 (100.0)	163 (100.0)	462 (100.0)		

*p value ≤ 0.05 was significant.

In this study, (64.7%) Compared to (35.3 %) of cases diagnosed as bacterial meningitis, this slight rise in the number of incidences of bacterial meningitis agrees with the diagnosis of non-bacterial meningitis. Several reports written on childhood meningitis from almost every region of Saudi Arabia.(Abomelha *etal*,1988) [24] Another study done in Egypt. Bacterial meningitis accounted for 73.3 % of the 623 cases of meningitis, compared with 26.7 % of non-bacterial meningitis in the studied population[25].

While a higher ratio of non-bacterial meningitis (87.34%) seen in another study done in Pittsburgh by Negrini et al who studied one hundred fifty-eight cases of meningitis[26]. Compared to viral meningitis in other countries, a high percentage of bacterial meningitis in some countries is multifactorial, but a vaccination program is the most likely cause. There are successful vaccinations against the three main bacterial pathogens responsible for bacterial meningitis, *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis*[27]. Other study revealed that non bacterial meningitis (74.5%) While bacterial meningitis (36.7 %). In our country, service of meningitis vaccine is often not available, and also the low socioeconomic state is regarded as a risk factor for increasing bacterial infection.

Conclusion

Bacterial meningitis are still occupying large percentage of cases admitted to hospital, and if undiagnosed promptly will have a high mortality.

Study limitation

The limitation of this study includes size of samples and other limitation not using advance technique such as PCR or For detecting N, RT-PCR.

Conflict of Interest: we declare that there is conflict of interest

Ethical Approval: the research approved by scientific and ethical committee at our department

Source of Funding: the research funded by the authors only

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