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Infectious Diseases

Meningitis among Children admitted to Benghazi Pediatrics Hospital during 2012

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Original Research Article

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Abstract: Meningitis is a severe and feared disease, caused by an infection of the fluid that surrounds the brain and spinal cord. It can be caused by bacteria, viruses, protozoa, fungi, and other agents. Many of the viruses and bacteria that cause meningitis are fairly common and often associated with routine illnesses. Bacterial meningitis is much less common but may result in severe complications. Therefore, it is extremely important to identify and treat bacterial meningitis early. To know the epidemiological picture of meningitis in patients at Benghazi Pediatric Hospital. A descriptive- cross sectional study conducted in Pediatric Hospital, Benghazi during a one year period from 1.1.2012 to 31.12.2012. The majority of meningitis cases were in males (58.5%) (41.5% in females), while the majority of meningitis cases were in the age group of below 1 year with 79.7%. In addition majority of meningitis cases were of the Bacterial type (44.1%) followed by the viral type (19.5%). Furthermore, most cases were in the Autumn (36.4%), followed by Summer (2.2%), Spring (19.5%), and Winter (11.9%). The most common drug used was Recphin (57.6%). The study shows that meningitis infection in males was more than in females, and it's common at children aged below 1 year. Bacterial type is more common than viral type, the most common drugs used was Recphin, the bacterial meningitis is more common during autumn and viral meningitis is more common during summer.

Keywords: Meningitis, Bacteria, Virus, Recphi.

INTRODUCTION

Meningitis (from Ancient Greek, "membrane" and the medical suffix -it is, "inflammation") is an acute inflammation of the protective membrane covering the brain and spinal cord, known collectively as the meanings.

The inflammation may be caused by infection with viruses, bacteria, or other microorganisms, and less commonly by certain drugs. Meningitis can be life-threatening because of inflammation's proximity to the brain and spinal cords [1]. The brain tissue may swell, pressure inside the skull may increase and the swollen brain may herniate through the skull base. This may be noticed by a decreasing level of consciousness, loss of the papillary light reflex, and abnormal posturing. The inflammation of the brain tissue may also obstruct the normal flow of CSF around the brain (hydrocephalus)[2]. Normally, meningitis causes fever, lethargy, and a decreased mental status (problems thinking), but these symptoms are often hard to detect in young children. If the infection or resulting inflammation progresses past the membranes of the brain or the spinal cord, then the process is called encephalitis (inflammation of the brain) [2]. The highest incidence of meningitis is between birth and 2 years, with the greatest risk immediately following birth and at 3-8 months of age. Increased exposure to infections and underlying immune system problems present at birth increase an infant's risk of meningitis Meningococcal meningitis is a life-threatening infection of the fluid and tissues surrounding the brain, caused by a bacterium known as Neisseria meningitides. The infection is spread person-to-person by exposure to secretions from the nose or throat [3]. Our aim was to Know the Epidemiological Picture of Meningitis patients at Benghazi Children Hospital, Benghazi, with the following objectives: to find the age and sex distribution of cases, to know the difference of treatment level, and to find the seasonal variations of the disease.

PATIENTS AND METHODS

Study design

Descriptive- cross sectional study. Place of study: The study was conducted in Benghazi Children Hospital, Benghazi.

Period of data collection

The study was done during 1st of June, 2013 to 30 th of September 2013.

Study subjects

All cases admitted to Benghazi Children Hospital during 1.1.2012 To 31.12.2012 were included in this study.

Data Collection

The Files Performa was designed from the case history file and in accordance with the requirements of aim and objectives of the study. Necessary permission for this study was sought from the authority including the treating doctors. All information present in the patient's records was collected and analyzed.

ANALYSIS

Data were analyzed with using the SPSS.(Statistical Package for the Social Sciences) software version 18,descriptive statistic number, percentage, mean, median, mode, and standard deviation were analyzed that were used is P Value ≤ 0.05 considered significant.

RESULTS & DISCUSSION

The results of our work show that Meningitis was found more in males than in females as shown in Figure 1.

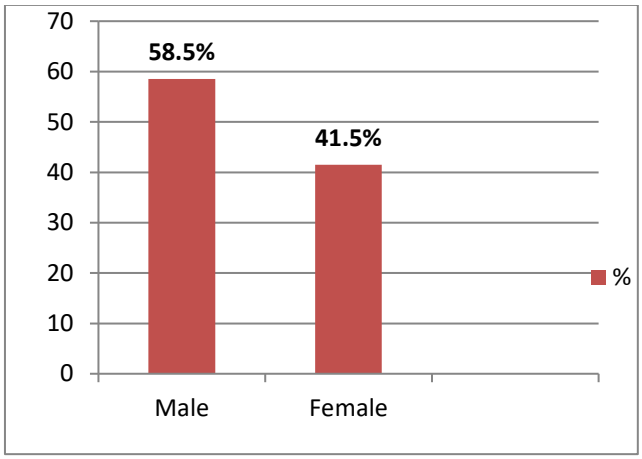

Fig-1: Distribution of patients according to sex

In a larger study in Iran, 100,000 population for males and females, respectively. The age-specific incidence averaged over the study period (1999-2005 inclusive) showed the highest incidence was among the male population less than 5 years of age. On average, the frequency of male cases was more than that of females, with an overall male-to-female incidence ratio of (2.1).[4] The majority of meningitis cases were in the age group of below 1 year (79.7%) as in Table 1.

Table-1: Distribution of patients according to Age.

Age	No.	%
<1	94	79.7
1-5	14	11.9
6-10	5	4.2
>10	5	4.2
Total	118	100

Mean= 15.1303, Median = 2, Mode=0.01 Std. Deviation= 33.90479
Minimum duration=less than o month Maximum duration =12 years.

The youngest child was 1 day old, and the oldest child as 12 years old. Different studies show the highest incidence of meningitis between birth and 2 years, with the greatest risk immediately following birth and 3-8 months of age. Increased exposure to infections and underlying immune system problems present at birth increase an infant's risk of meningitis [1,3] Bacterial type was constitute to (44.1%) followed by the Viral type (19.5%), while (36.4%) was not recorded as show in Figure 2, as in all of the studies evaluating the potential to differentiate bacterial from viral meningitis[5].

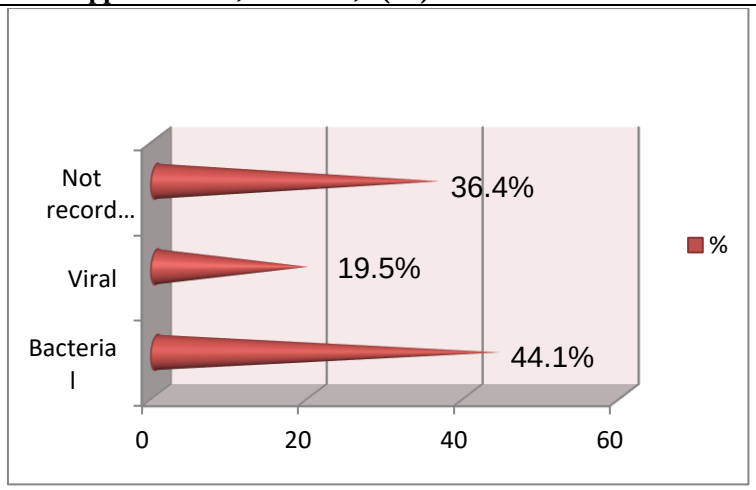

Fig-2: Distribution of patients according to type of infection

The most common causative bacteria of community-acquired bacterial meningitis in children aged 3 months and older are S. pneumonia and. Meningitides, causing (80%) of cases I the United States [6,7] **,** but in the medical record of the patients was not recorded the type of the Bactria**.** The majority are admitted with history of fever, vomiting, cough and loss of appetite, followed by diarrhea, crying, rash, headache, abnormal movement and photophobia, etc as in Table 2.

Table-2: Distribution of patients according to Signs & Symptom

Symptoms	**No.**	**%**
FEVER	90	76.3
VOMITING	47	39.8
DIRRHEA	34	28.7
SNEEZING	7	5.9
DEHYDRAET	7	5.9
HEADACH	17	14.4
RASH	19	16.1
Photophobia	7	5.9
LOSE of APPI	35	29.7
Abnormal Movement	10	8.5
CRYING	24	20.3
COUGH	37	31.4
Urine	5	4.2

The most common drugs were Rocephin 57.6%, Ampicillin 47.5%, Gentamycin 42.4%, Calpol 39.8% etc. as shown in Table 3. In (UK) United Kingdom empirical treatment consists of third-generation cephalosporin such as cefotaxime or ceftriaxone [8,6]. While in the United State America, where resistance to cefalosporine is increasingly found in streptococci, addition of vancomycin to the initial treatment is recommended [9,10,4],

Table-3: Distribution of patients according to type of treatment

Type of treatment	**No.**	**%**
Calpol	47	39.8
Calfron	34	28.8
Ampicillin	56	47.5
Recphin	58	57.6
Folic acid	4	3.4
Vit.D	6	5.1
Gentamycin	50	42.4
Zinc	7	5.9

Chloramphenicol, either alone or in combination with Ampicillin, however, appears to work equally well[11]. Mild cases of viral meningitis can be treated at home with conservative measures such as

fluid, bed rest, and analgesics[12]. Most patients stayed at hospital for 8 – 14 days, 44.9% and the least number patients stayed at hospital was 22-28 days, 5.1% and the duration was starting from1day to 28 days as in Table 4.

Table-4: Distribution of patients according to Duration of Hospital stay

Duration of Hospital stay/ days	**No.**	**%**
1 – 7	43	36.4
8 – 14	53	44.9
15 -21	16	13.6
22 – 28	6	5.1
Total	118	100

Mean= 10.1. Std.Deviation = 5.6. Median = 9. = Mode = 9. Minimum duration =1day. Maximum duration = 28 days.

Most cases were in the autumn 36.4%, followed bySummer 2.2%, Spring 19.5%, Winter 11.9% as in figure 3. Meningitis were found more in cases of bacterial infection, which were in the Autumn with 40.4%, followed by the summer with 36.5%, winter and spring with same value 11.5% (Table 5).

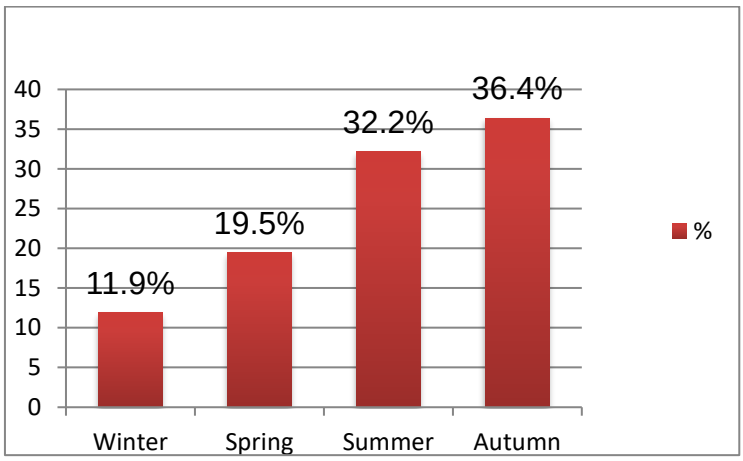

Fig-3: Distribution of patients according to season

Table-5: Distribution of patients according to season and type of infection

Season	Bacterial		Viral		Total	
	No.	%	No.	%	No.	%
Winter	6	11.5	2	8.7	8	10.7
Spring	6	11.5	3	13	9	12
Summer	19	36.5	12	52.2	31	41.3
Autumn	21	40.4	6	26.1	27	36
Total	52	100	23	100	75	100

Bacterial meningitis occurs most often from late winter to early spring. It usually causes serious illness and can be life-threatening [13]. But the Majority of Meningitis cases of viral infection were in the summer with 52.2%, followed by autumn with 26.1%.spring with 13%, and winter with 8.7% (Table 5). Viral meningitis is more common in the late summer and early fall. It usually does not cause serious illness [13]. That means the bacterial meningitis is more common during autumn and viral meningitis is more common during summer. In most cases were 41.3% during summer, and the least cases in both type were during winter. Another study in Tehran 1998 shows a higher risk of disease in the spring and fall compared to summer and winter. While there is not much difference in terms of humidity during the four seasons, Tehran has dry weather, with precipitation barely exceeding 0.5 centimeters per year [14]. Furthermore, one of the main sources of air pollution in Tehran is a high concentration of particulate matter consisting mainly of dust[15], that could contribute to higher risk of meningitis in this population. Most cases of males were during autumn with 37.7%, and the most cases of female were during summer with 36.7%. And the most cases of both sexes were during autumn with 36.4% as shown in Table 6.

Table-6: Distribution of patients according to season and sex

Season	male		female		Total	
	No.	%	No.	%	No.	%
Winter	9	13	5	10.2	14	11.9
Spring	14	20.3	9	18.4	23	19.5
Summer	20	29	18	36.7	38	32.2
Autumn	26	37.7	17	34.7	43	36.4
Total	96	100	49	100	118	100

X^2= 0.853 df= 3. p =0.837(Not significant).

Majority of Meningitis cases were in the age group of below 1 year with 84,6% in Bacterial and 69.6% inViral, followed by 11.5% Bacterial and 21.7% Viral, the children were in the age group of 1-5 years. Age group of 6-10 and >10 years were 1.9% in Bacterial and 4.3% in Viral. The youngest child was of 1 day old after birth admitted with Meningitis and the oldest child was 12 years old in this study as show in Table 7.

Table-7: Distribution of patients according to Age and type of infection

Age	Bacterial		Viral		Total	
	No.	%	No.	%	No.	%
<1	44	84.6	16	69.6	60	80
1-5	6	11.5	5	21.7	11	14.7
6-10	1	1.9	1	4.3	2	2.7
>10	1	1.9	1	4.3	2	2.7
Total	52	100	23	100	75	100

CONCLUSION

To conclude from this work the meningitis infect the males more than females, and it's common at children whose age below 1 year. Bacterial type is common more than viral type, the most common drugs used was Recphin. The most clinical symptoms of Meningitis were fever, vomiting, Cough and loss of appetite, the bacterial meningitis is more common during autumn and viral meningitis is more common during summer.

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