

A Study of Meningitis in Adults

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Introduction

A planned study was carried out for a period of five years commencing in 1983 until 1987. A total number of 120 cases suffering from meningitis were studied. Cases were collected from a general Medical ward at Khyber Teaching Hospital, Peshawar. The period of admission was seven days in a month. Days of admission were divided on rotation basis, equally among the four Medical units of the hospital. Although all age groups were included in this study, there were mostly adult patients. Patients under the age of 13 were admitted to the Paediatric unit of this hospital and are not part of this study. As there are no separate Geriatric units, therefore, all elderly patients needing admission with the suspected diagnosis of meningitis were also included in this study.

Mode of Admission

Sources of patients were the out-patient department and accident and emergency department of the hospital. Other sources were cases referred by the family practitioners and from private clinics. Some patients were also referred from the peripheral hospitals where either the patients were in moribund state or the response to the treatment was poor. The patients who needed further investigations were also accepted.

Ethnic Variation in the Patients

Patients were not only the indigenous population of N.W.F.P. which included people from settled areas as well as from the tribal areas but also the refugees from Afghanistan now living in this province. Amazingly there was a high proportion of people from Afghanistan as shown in Table I. Out of 120 patients, 80 were Pakistanis, 38 patients were from Afghanistan and two patients came from border areas therefore having dual nationality.

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TABLE I
(SHOWING PROPORTION OF PAKISTANI & AFGHAN PATIENTS)

Nationality	No. of Patients
Pakistani	80
Afghan	38
Tribe with dual status	02
Total	120

Method

In history taking, a questionnaire of relevant complaints was followed. In stuporous or unconscious patients, information was gained from the attendants and the relatives. The questionnaire included information such as history of headache, fever, vomiting, photophobia, confusional state, cough, sore throat and neurological complications etc.

History of tuberculosis, aural problems, sinusitis and boils was also asked for. History of road traffic accidents and exposure to bullets, shrapnel and bomb blasts was also asked. This was important because some patients included in this study were Afghans. History of surgical interference was equally important.

Full clinical examination was carried out in all patients with special emphasis on the neurological aspect such as body posture, response to light, neck rigidity, Kernig's sign, Brudzinski's sign. Evidence of encephalitis and meningo-encephalitis was looked for by assessing level of consciousness, pupillary responses and fundoscopy etc.

Laboratory Investigations

These included full blood count, E.S.R. and urine examination. Cerebrospinal fluid was examined in all cases. Blood urea and glucose examination was also carried out.

Examination of C.S.F. included naked eye appearance e.g. colour, turbidity and clot formation. Proteins and glucose content of the C.S.F. were always estimated.

Microscopic examination of the C.S.F. included total and differential cell count, Gram's staining and staining for acid fast bacilli. Culture of the C.S.F. and, where-ever possible, blood cultures were also carried out. Emphasis was not made on culture of the specimens because many patients, before they reached us, already had some form of chemotherapy.

X-Ray of the chest was taken in almost all cases. Where indicated, X-Ray of skull and para-nasal sinuses were also done.

Throat and ear swabs were taken in some cases.

Disease Prevalence in Afghan Refugees

Population of Peshawar region is about 3.5 lacs. About two million Afghans have migrated into N.W.F.P. who are mostly around Peshawar region. Keeping the fact in mind that there is comparatively more illiteracy in the refugees than the indigenous population, it seems that the disease is far more prevalent in the refugee population than the local population.

Refugees live in very uncertain and precarious conditions. Their living conditions are unhygienic with primitive sanitary conditions. The water supply is also unsatisfactory. They are under far more stress in their life. All these factors are contributory towards their increased susceptibility to this fatal disease.

There was an interesting observation that although apparently both sexes were more or less equally involved: being 62 male and 58 female patients (Table II), detailed analysis showed different figures.

TABLE II
(SHOWING MALE TO FEMALE RATIO)

Sex	Pakistani	Afghan	Dual	Total
Male	37	24	1	62
Female	43	14	1	58
Total	80	38	2	120

It appeared Pakistani women were more affected by the disease process as compared to Afghan women. Pakistani social life is based on a mixed population, whereas, the Afghan style of life is comparatively segregated one. This may partially explain the fact that the disease was more common in Afghan males.

Age Pattern

There was extreme variation in ages of the patients. It varied between 13 to 95 years in cases of males. Mean age in males was 27.7 years. In case of females, it varied between 13 to 40 years and mean age was 24.2 years. So compared to males, females were in a younger age range.

Correlation of Number of Patients with Solar Months

There were more admissions in the spring months and early summer. Maximum number of admissions were in the month of March and minimum in the month of August as shown in Table III.

TABLE III
(SHOWING NUMBER OF ADMISSION ON MONTHLY BASIS)

Month of the year	Number of Admissions
January	5
February	12
March	23
April	17
May	15
June	17
July	7
August	3
September	5
October	5
November	5
December	6
Total	120

Stay in the Hospital

The average stay of the patient in the hospital was between 2 to 3 weeks. Majority of the patients, as shown in Table No. IV stayed upto 2 weeks. A few patients had to be discharged from the ward within a period of one week because of their unwillingness to stay longer. Some patients had to stay more than 4 weeks because of complications.

TABLE IV
(SHOWING STAY IN HOSPITAL)

Duration of stay	Upto one week	Upto two weeks	Between 2-3 weeks	Between 3-4 weeks	More than 4 weeks	Total
Number of patients	10	50	24	8	6	98

Mortality

In spite of all possible efforts on the part of the medical and the nursing staff, mortality figures were quite high in this series.

Out of 120 patients included in this study, 98 were discharged home (see Table No.IV) whereas 22 patients died in the hospital. Detailed analysis of the patients who died is shown in Table No.V.

TABLE V
(SHOWING DETAILS OF MORTALITY FIGURES)

Sex	Pakistani	Afghan	Total
Male	6	6	12
Female	4	6	10
Total	10	12	22

Overall mortality rate was 18.3 percent. Mortality figures were quite high in Afghan patients as compared to Pakistani patients. Indeed in terms of absolute values, it was 31.7 percent in Afghan patients.

Reasons for high mortality in general and Afghan patients in particular are:

1. Ignorance and illiteracy.
2. Poverty.
3. Wrong diagnosis.
4. Correct diagnosis but wrong treatment.
5. Ineffectiveness of drugs.
6. Discontinuation of treatment before full recovery.
7. Delay in arrival of the patients to hospital. Delay could be in days and sometimes weeks, thereby causing complications and presenting masked clinical picture of the disease.

As more Afghans are living in Peshawar and round-about areas, it appears that this may be the reason for their easy access to Khyber Hospital, Peshawar and so, therefore, more cases were admitted from the Afghan population.

Treatment

Many drugs were used. The antibiotics were mostly given in combination because of the serious nature of the disease which has a very high mortality. The drugs were:

Chloramphenicol
Amoxil
Ampiclox
Penicillin
Trimethoprim/Sulphamethoxazole (Septram/Bactrium)
Gentacyn
Streptomycin
Diateben forte (Thiacetazone and isoniazid)
Rifampicin
Isoniazid
Pyrazinamide
Myambutol

Other groups of drugs used were corticosteroids, antiemetics and antimalarials. Feeding was carried out with help of nasogastric intubation in case of unconscious patients. In addition intravenous infusions were given,

where-ever appropriate, to take care of hydration status, calorie, protein and vitamin requirements.

Examination of the C.S.F.

Depending on the history, clinical examination and the result of investigations on cerebro-spinal fluid, cases were treated for tuberculous or pyogenic meningitis. Naked eye appearance of the C.S.F. was of utmost importance in helping in ascertaining the diagnosis. Turbid C.S.F. favoured pyogenic meningitis whereas clot formation favoured tuberculous meningitis. It was also desirable, although this could not always be fulfilled, to have reliable laboratory reports of the C.S.F. It must be admitted that very often the laboratory reports of the C.S.F. would not correlate with the clinical picture and the clinician incharge would always have to review carefully the most suitable treatment of his patient.

Types of Meningitis

Patients fell into two broad categories (see Table No.VI): either tuberculous or pyogenic meningitis. There were 59 patients diagnosed suffering from tuberculous meningitis, whereas 57 patients were suffering from pyogenic meningitis. Four patients were labelled to be suffering from viral meningitis. In case of viral meningitis, 2 had mumps and the other two were suffering from infective hepatitis.

TABLE VI
(SHOWING TYPES OF MENINGITIS)

Type of	No. of Pakistani patients	No. of Afghan patients	No. of patients with dual nationality	Total
Tuberculous	47	11	1	59
Pyogenic	29	27	1	57
Viral	4	0	0	4
Total	80	38	2	120

There was one interesting finding (see Table No. VI). The total number of patients in the two main types of meningitis was more or less the same i.e. 59 patients in tuberculous type and 57 patients in pyogenic type. But when one went into detailed analysis, it was revealed that out of 59 cases in the tuberculous group, 47 were Pakistani and 11 were Afghans. Similarly out of 57 patients of pyogenic meningitis, 29 were Pakistani and 27 were Afghan. So it was found that tuberculous meningitis was more common in Pakistani patients whereas pyogenic meningitis was more common in Afghan patients.

(Note: At the time of writing this paper, there was an epidemic of meningitis due to *Neisseria meningitidis* in Peshawar district, and this paper does not take that into consideration).

Conclusion

A great deal could be done for the prevention of this disease which has a fatal outcome: (1) By educating the general public. (2) By holding educational seminars for medical personnel which would also include medical administrators, doctors, nurses and para-medical staff. (3) The fear of disease should be eliminated from the mind of the public by education through radio, television and newspapers. (4) People who are prone to infection should be vaccinated with the appropriate vaccine.

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