Morbidity and Mortality of Children Hospitalized with Medical Disorders in Afghanistan

by RAJENDRA NATH SRIVASTAVA, F.R.C.P.(Ed.), D.C.H. (Associate President), ABDUL RASHID GHANI, M.D. (Consultant), SHAFIQA AZAMI, M.D. (Consultant), MAHARAJ KRISHAN BHAN, M.D. (Assistant Professor) *and* GOVERDHAN DAS MOGLI, M.A., B.Com., Dip. Medical Records, Statistician-cum-Medical Record Librarian

Institute of Child Health, Kabul, Afghanistan

Afghanistan is a developing, thinly populated, land-locked country with an area of 636,266 sq. km and a population of 17 million. There are vast deserts and mountainous regions and a small cultivable area. The economy is largely based on agriculture, livestock and fruit industry. Eighty percent of the population live in about 17,000 villages, many of which are remote and isolated, presenting problems of communication, especially during 3 months in winter when they are snowbound. Fourteen percent are nomadic. Other data indicate a large proportion of low age group population, a high dependency rate of 1 to 27 and an infant mortality rate of 185 per thousand. Modern medical facilities are available in the provincial capitals. Basic health services are provided through primary health centres, one for about 61,000 population. Thirty-three percent have access to safe water. Sanitary and hygienic conditions are generally unsatisfactory.

Very little information is available regarding the pattern of morbidity and mortality in children in Afghanistan. Such data are provided in this report which is based on the analysis of cases admitted to the Institute of Child Health over a period of 3 years.

Patients and Methods

The Institute of Child Health was established in 1972 at the capital city of Kabul (population approximately ½ million). It has 130 hospital beds for inpatients; 80 for patients with medical disorders and infectious diseases and 50 for various surgical disciplines. The hospital admits patients from Kabul and its suburbs and serves as a referral centre for patients from the provinces. Due to a shortage of inpatient accommodation, however, only seriously ill patients are admitted, e.g. acute gastroenteritis with dehydration requiring intravenous fluids, severe respiratory disease needing oxygen therapy, meningitis, etc. The Institute is also a centre for postgraduate training in different fields of pediatrics for medical and paramedical staff.

Records of all patients hospitalized during 1973 and 1975 were examined. Data available in all cases included age, sex, weight, clinical and laboratory evaluation, final diagnosis and the outcome. Wherever a patient had more than one disease, the condition considered to contribute most to the illness was regarded as the primary diagnosis.

Observations

Over a period of three years, 17,500 patients were admitted of whom 15,506 were in the various medical wards.

Age and Sex Distribution

Seventy percent of the patients were below the age of 5 years and 40% below 2 years. Of the under-5 age group, 70% were below 2 years. The number of children in the 1st and 2nd year groups was almost equal. Males dominated in all age groups constituting 60% of all.

Morbidity Pattern

Table 2 shows the primary diseases in relation to the age. Patients with gastroenteritis and respiratory infections together accounted for 50% of all admissions. Next in order of frequency were malnutrition (3.7%), tuberculosis including tuberculosis meningitis (3.5%), diphtheria, pertussis and tetanus (2.9%), amoebic and bacillary dysentery (2.2%), and typhoid (2.2%). Helminthic and other parasitic infections were seldom recorded as the primary conditions. Routine stool examinations showed ascariasis in 61% and giardiasis in 11%.

Table 2 also relates the diseases with different age groups. Forty-five percent of admissions in patients between 1 month to 2 years were due to acute

Acknowledgements

We thank Mr. G. Ramalingam of Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India, for his help with the statistical analysis. The secretarial assistance of Mr. V. B. Totlani is gratefully acknowledged.

Table 1
Age and Sex Distribution of 15,506 Consecutive Admissions, Correlation with Mortality

Age group	Number of patients			Percentage of total patients	Number of deaths	Death rate of this group (%)	Percentage of deaths occurring in this group
	Male (%)	Female (%)	Total				
0–4 weeks	305 (61.6)	190 (38.4)	495	3.2	131	26.5	11.8
1–11 months	2166 (61.5)	1359 (38.5)	3525	22.7	279	7.9	25.0
1–2 years	1972 (60.6)	1283 (39.4)	3255	21.0	201	6.1	18.0
2–3 years	1157 (59.5)	789 (40.5)	1946	12.5	148	7.6	13.2
3–4 years	692 (68.0)	326 (32.0)	1018	6.6	99	9.7	8.9
4–5 years	468 (66.0)	242 (34.0)	710	4.6	46	6.5	4.1
5–8 years	1232 (64.0)	689 (36.0)	1921	12.4	118	6.1	10.5
8–11 years	852 (55.0)	692 (45.0)	1544	10.0	58	3.7	5.2
11–14 years	762 (69.7)	330 (30.3)	1092	7.0	37	3.3	3.3
Total 0–14 years	9606 (61.9)	5900 (38.1)	15506 (100%)	100.0	1117	7.2	100.0

gastroenteritis and dehydration. Its incidence was highest (55.5%) during 2nd year and declined thereafter from 34% in 3rd year to 13% in patients between 5 to 8 years. Majority of the patients with acute gastroenteritis were admitted during the summer months of April to July. The relative incidence of respiratory infections was high in infants below 1 month (22%) and in the latter part of first year (24%); subsequently it ranged between 13–15% in patients between 1 to 8 years.

Malnutrition, invariably severe, was the primary diagnosis in 3.7% of the patients and an associated feature in another 7.5% of the patients, mostly admitted with serious infections, which included gastroenteritis (35.8%), respiratory infections (12.7%), acute amoebic dysentery (22.5%) and bacillary dysentery (8.2%). The incidence of malnutrition was 12.5% in patients below the age of 5 years. The analysis of weight pattern of all children with primary and secondary diagnosis of malnutrition showed that 84% weighed less than 60% of the Harvard mean.

Mortality Pattern

Table 3 shows the main causes of death. The overall mortality was 7.2%. Acute gastroenteritis and respiratory infections accounted for 62.7% of all deaths. The proportionately high mortality from pyogenic meningitis, neonatal sepsis and malignancies is evident. The mortality from acute respiratory infections (10%) was almost twice as that from gastroenteritis. Malnutrition, diphtheria and tetanus were also associated with high death rates.

The mortality rates in different age groups are shown in Table 1. It was highest in the neonatal period (26.5%). Patients between 1 month and 2 years accounted for 42.5% of the total mortality. The death rate continued to be high during third and fourth years, forming 25% of the total mortality. Fifty-two percent of all deaths occurred within 48 hours of admission (Table 3).

Discussion

Our data on the pattern of mortality and morbidity are hospital-based and cannot be claimed to represent the epidemiology of the entire community, especially since health care facilities are not uniformly distributed. They would nevertheless be expected to reflect the pattern of serious illness in children and the ensuing mortality.

The pre-eminence of acute gastroenteritis and respiratory infections as the leading causes for hospital admissions is evident. A similar picture has been observed in other developing countries.[1,2] In our patients acute gastroenteritis was mainly seen in those below the age of 5 years and despite fluid therapy and supportive care, it was associated with considerable mortality. Gastroenteritis and other enteric infections are closely related to poor sanitary and hygienic conditions, and much of the morbidity would be expected to be preventable. Experience in several countries indicates that oral glucose electrolyte solutions if given in the early stages of the disease, help to reduce the incidence of mortality.[3] Health education regarding hygienic measures and protection of food from flies, which profusely multiply in summer, should also play an important role in prevention.

Acute respiratory infections, mainly bronchopneumonia and bronchiolitis, take a heavy toll in winter months, particularly in infants and small children with associated malnutrition.[1] An important factor contributing to the high mortality in our patients was their late arrival at the hospital and inadequate facilities for the management of respiratory failure simultaneously in a number of patients.

The relatively small number of patients with malnutrition is explained by the fact that only

Table 2
Morbidity, Main Causes

Primary diagnosis	Frequency of this diagnosis in age group = % age group with this diagnosis (figures in parenthesis)									
	0–4 weeks	1–11 months	1–2 years	2–3 years	3–4 years	4–5 years	5–8 years	8–11 years	11–14 years	Total
Gastroenteritis	69 (13.5)	2026 (57.4)	1805 (55.4)	667 (34.2)	245 (24.0)	97 (13.6)	251 (13.1)	113 (7.3)	57 (5.2)	5330
Acute respiratory infection	108 (21.8)	847 (24.0)	519 (15.9)	320 (16.4)	181 (17.7)	117 (16.4)	250 (13.0)	129 (8.3)	93 (8.5)	2564
CNS infection*	4 (0.8)	57 (1.6)	43 (1.3)	44 (2.3)	38 (3.7)	30 (4.2)	66 (3.4)	51 (3.3)	35 (3.2)	368
DPT †	13 (2.6)	35 (1.0)	56 (1.7)	31 (1.5)	36 (3.5)	37 (5.2)	120 (6.2)	92 (5.9)	42 (3.8)	462
Neonatal sepsis	157 (31.7)	—	—	—	—	—	—	—	—	157
Haematological disorders	4 (0.8)	23 (0.7)	32 (1.0)	38 (1.9)	23 (2.2)	24 (3.3)	50 (2.6)	60 (3.8)	51 (4.6)	305
Malnutrition	1	106 (3.0)	173 (5.3)	159 (8.1)	59 (5.7)	27 (3.8)	30 (1.5)	16 (1.0)	10 (0.9)	581
Tuberculosis	1	15 (0.5)	39 (1.2)	38 (1.9)	34 (3.3)	30 (4.2)	156 (8.1)	131 (8.4)	110 (10.0)	554
Malformation	66 (13.4)	54 (1.5)	56 (1.7)	31 (1.5)	22 (2.2)	18 (2.5)	61 (3.1)	44 (2.8)	15 (1.3)	367
Bacillary and amoebic dysentery	1	38 (1.0)	92 (2.8)	68 (3.4)	27 (2.6)	34 (4.7)	50 (2.6)	34 (2.2)	19 (1.7)	363
Typhoid	—	7 (0.2)	12 (0.4)	12 (0.6)	18 (1.7)	21 (2.9)	127 (6.6)	90 (5.8)	44 (4.0)	331
Measles	—	36 (1.0)	36 (1.1)	37 (1.9)	23 (2.2)	14 (1.9)	23 (1.2)	9 (0.5)	7 (0.6)	185
Cardiovascular disease	9 (1.8)	12 (0.4)	11 (0.3)	5 (0.3)	10 (0.9)	10 (1.4)	35 (1.8)	69 (4.4)	69 (6.3)	230
Acute nephritis and nephrosis	—	1	4 (0.1)	6 (0.3)	13 (1.2)	22 (3.0)	43 (2.2)	35 (2.3)	37 (3.4)	161
Neoplasm	6 (1.2)	17 (0.5)	6 (0.2)	12 (0.6)	12 (1.1)	4 (0.5)	21 (1.1)	30 (1.9)	29 (2.6)	137
Cirrhosis	—	10 (0.3)	5 (0.2)	13 (0.7)	8 (0.7)	14 (1.9)	28 (1.5)	19 (1.2)	13 (1.2)	110
Total	439 (87.6)	3284 (93.1)	2889 (88.6)	1481 (75.6)	749 (72.7)	499 (70.3)	1311 (68.0)	922 (59.1)	631 (57.3)	12205

* Pyogenic meningitis Encephalitis. † Diphtheria, pertussis, tetanus.

Table 3
Mortality up to 14 Years, Main Causes and Time of Death

Diagnosis	Number of patients	Number of deaths		Total	Case fatality rate (percentage)
		Within 48 hours (percentage)	After 48 hours (percentage)		
Gastroenteritis	5333	161 (58.5)	114 (41.5)	275	5.1
Acute respiratory infection*	2566	169 (64.5)	93 (35.5)	262	10.2
CNS infections (Non-tubercular)	362	55 (55.5)	44 (45.5)	99	27.3
DPT†	465	47 (65.2)	25 (34.8)	72	15.4
Malnutrition	583	26 (39.4)	40 (60.6)	66	11.3
Neonatal sepsis	157	38 (65.5)	20 (34.5)	58	37.0
Tuberculosis including meningitis	554	13 (28.3)	33 (71.7)	46	8.4
Malformations	373	9 (27.3)	24 (72.7)	33	8.8
Anemia and other haematological disorders	330	13 (46.5)	15 (53.5)	28	8.4
Malignant neoplasm	68	3 (17.5)	14 (82.5)	17	25.0
Total	10,791	534 (55.8)	422 (44.2)	956 (100.0)	8.8

* Pneumonia, bronchiolitis
† Diphtheria, pertussis, tetanus.

severely affected ones were admitted, because of lack of beds particularly during summer months. Although prolonged breast feeding is traditionally practised in Afghanistan, and wheat bread is freely and cheaply available (subsidized by the Government), malnutrition in small children is quite frequent. The chief contributing factors include recurrent gastrointestinal and other infections and intestinal parasitic infestations, which are extremely common, and a lack of knowledge of the dietary needs for small children. The practice of withholding food during common infections is widely observed. Adequate medical facilities for interference to break the vicious infection—malnutrition circle are not available in the villages.[4]

The high morbidity from diphtheria, pertussis and tetanus reflects the low immunization status of the community. Majority of the patients with tetanus were neonates,[5] while diphtheria was observed in older children. The lesser number of patients with measles is due to the fact that only those with serious complications were admitted.

Neonatal sepsis is usually associated with a high mortality, unless early detection, bacteriologic diagnosis and appropriate management under intensive care conditions is possible.[1,5] In this country, survival of a newborn baby is still regarded as a small miracle, especially in the villages. It is reasonable to assume that a large number of newborns succumb before receiving any medical care.

Mortality in our patients below the age of 5 years accounted for 80% of all. The greater vulnerability of the under-5 age group to infections and malnutrition is well recognized.[6,7] Experience in western countries indicates that the incidence of diarrhoea–pneumonia complex is brought down by improvement in socioeconomic and environmental conditions, without necessitating application of antimicrobial drugs and sophisticated medical care.[8] A large proportion of the country's health budget is spent on the hospitals for the treatment of essentially preventable conditions, which have a high recurrence rate. Some of the measures which can be effective in reduction of the common childhood diseases include provision of safe water, immunizations, health education[9,10] especially directed towards personal and environmental hygiene, nutrition and child spacing, and provision of relevant medical facilities.

Summary

Over a 3-year period, 15,506 children were admitted to medical wards of the Institute of Child Health, at Kabul, Afghanistan. Sixty percent were boys. Seventy percent were below 5 years and 40% below 2 years. Patients with gastroenteritis and respiratory infections made up 50% of all admissions. Next in order of frequency were malnutrition, tuberculosis, diphtheria, tetanus and dysentery. Sixty percent of stools tested showed ascariasis and 17% amebiasis. Fifty-five percent of the patients between 1 month to 2 years had acute gastroenteritis, mainly during summer. The overall mortality was 7.2%, being 5.1% in gastroenteritis and 10% in respiratory infections. Patients between 1 month to 2 years accounted for 42.5% of the mortality and those between 2–4 years 25%. Fifty-two percent of all deaths occurred within 48 hours of admission. The observations bring out the importance of gastrointestinal and respiratory infections and the vulnerability of the under-5 age group. The need for health education, immunization and provision of safe water is evident.

References

1. Stephen, J. C. (1974). "Hospital diagnosis of children aged 0 to 5 years in Cameroon." *J. Trop. Pediat. and Envir. Child Health*, **20**, 191–195.

2. Jelliffe, D. B. and Welbourn, H. F. (1965). "Pediatrics in Uganda."*Clin. Pediat.*, **4**, 55–61.
3. Editorial (1975). "Oral glucose/electrolyte therapy for acute diarrhoea." *Lancet*, **1**, 79–80.
4. Morehead, C. D., Morehead, M. and Allen, D. M. (1974). "Bacterial infections in malnourished children." *J. Trop. Pediat. and Envir. Child Health*, **20**, 141–147.
5. Bwibo, N. O. (1971). "The role of neonatal infection in neonatal and childhood mortality." *J. Trop. Pediat. and Envir. Child Health*, **17**, 89–90.
6. Lintermans, J. P. (1972). "A survey of childhood mortality in a Congolese University Hospital." *Clin. Pediat.*, **18**, 20–24.
7. King, M. (1973). *Medical care in the developing world.* Nairobi, Oxford University Press.
8. Wray, J. D. (1973). "Child care in the Peoples' Republic of China." *Pediatrics*, **55**, 539–549.
9. Jelliffe, D. B. (1966). Pediatrics, in M. King (ed.) *Medical care in developing world.*
10. Williams, C. D. and Jelliffe, D. B. (1972). *Mother and Child Health. Delivering the Services.* London, Oxford Medical Publishers.