

CHILDHOOD MORBIDITY AND MORTALITY IN A LARGE HOSPITAL OVER LAST FOUR DECADES

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ABSTRACT

Pediatric statistics in a 50-year-old large hospital were analysed to find out any change in pediatric admission rate, morbidity and mortality and outcome of common disorders during the last four decades. Information was collected from four block years from each of the last four decades and compared. An increase of almost 250% in the total pediatric admissions as compared to an increase of 150% in total hospital admissions over last four decades suggest an increased awareness of maternal and child health by the community. The pediatric mortality excluding neonates has not shown a significant fall over the last four decades, being 14.6, 12.7 and 13.0% in 1955-1958, 1974-1977 and 1984-1987, respectively. Diarrheal disorders, pneumonia, tetanus and infections of central nervous system continue to remain the common causes of hospital admissions in children. The morbidity and mortality in these disorders, in general, have shown a significant decline though less appreciable in pyogenic meningitis, encephalitis and tetanus cases.

Key words: Morbidity, Mortality, Hospital admissions.

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An awareness of the morbidity and mortality pattern prevalent in hospitalized children is of great importance to pediatricians as it reflects the preponderance of a given illness and also the changing pattern of various illnesses in a community. This study was carried out to find out if there was any increase in pediatric admissions, any change in pediatric mortality or any change in the incidence and outcome of common pediatric disorders over the last four decades.

Material and Methods

The study was carried out at Lok Nayak Jai Prakash Narayan Hospital, Delhi which is a large 50-year-old hospital attached to Maulana Azad Medical College, New Delhi. The official pediatric bed strength of the hospital had been 50, 75 and 150 in fifties, seventies and eighties, respectively. However, as admissions were not restricted, the actual bed strength had always been high (at least 1.5 times). Intensive care and special laboratory facilities were available from hospital common pool only. Majority of patients admitted to this hospital came from walled city of Old Delhi, urban slums, adjoining neighbouring states (mainly Uttar Pradesh, Rajasthan, Haryana) and they belonged to lower and middle socio-economic strata of the community. The data of children below twelve years of age who had been admitted to the pediatric medical wards were collected and analysed. Statistics in relation to hospital born neonates has not been detailed here. Children admitted under other specialities, e.g., pediatric surgery, orthopedic, ENT, etc. were not included. The required information was collected for four years from each of the last four decades and compared. Four year block periods were

chosen, as data of fifties were available from 1955 to 1958 only, from a study published earlier from the same Department(1).

Hospital medical record section came into existence only in early sixties and newborn was separately categorized in late sixties. The number of patients left against medical advice and absconded accounted for 5% of hospital patients and 6% of pediatric admissions in eighties.

Results

Table I shows that pediatric admissions (excluding nursery) were only 11,393 in 1955-1958 block period and have increased by almost three times to 31,187 in the current block period of 1984-1987. In overall hospital context, from 1965-1968 to 1984-1987, e.g., over 22 years total hospital admission figures showed one and half times rise in admission rate, while for pediatrics the increase has been two and a half times.

In decade wise break-up, pediatric admissions (including nursery) were 11.6,

16.7 and 18.4% of total hospital admission in 1965-1968, 1974-1977 and 1984-1987 block years ($p < 0.001$). However, excluding nursery, pediatric admissions as percentage of total hospital admission are more or less similar at 12% in the past decades.

Overall pediatric mortality has significantly come down from 15.6% in 65-68 to 11.0% in 74-77 and 10.8% in 84-87. However, when neonatal mortality is excluded, a fall in pediatric mortality since fifties is less striking though still remains significant. Like admission rates, mortality percentage has also remained similar in the last decade.

Diarrheal disorders continue to remain the commonest cause of hospital admission in children followed by pneumonia (bacterial) and infection of central nervous system over the last four decades. For convenience, only these morbidities have been compared here, because of their maximum impact on child health. These common pediatric disorders together were responsible for 44.9, 44.8 and 37.4% of pediatric admissions and 71.1, 64.2 and 47.6% of

TABLE I—Pediatric Statistics

Year	Hospital admission	Pediatric Statistics (including nursery)		Pediatric Statistics (excluding nursery)	
		Admission	Mortality	Admission	Mortality
1955-58	NA	NA	NA	11,393	1,660* (14.6)
1965-68	1,73,176	20,084 (11.6)	3,140 (15.6)*	NA	NA
1974-77	2,10,135	35,119 (16.7)	3,869 (11.0)**	25,593 (12.2)	3,242 (12.7)**
1984-87	2,58,066	47,430 (18.4)	5,117 (10.8)**	31,187 (12.1)	4,059 (13.0)**

NA = Not available; P value* vs ** < 0.001

Admission percentages are out of total hospital admissions.

Figures in parentheses represent percentages.

pediatric mortality during 1955-1958, 1974-1977 and 1984-1987 respectively. Mortality in pediatric diseases has shown a variable decline except encephalitis cases (Table II).

Discussion

Forty per cent of population of India is in pediatric age group and nearly half of the total mortality occurs in this age group. Childhood morbidity and mortality is in-

fluenced by factors which are both medical and social(2,3). Unfortunately, a detailed record of social factors is not always made. But any change in percentage of pediatric admissions over a period may serve as a crude index of awareness of community towards child health. We observed that total hospital admissions have been increasing by 20-22% every decade over last three decades. While increase in total hospital admissions from sixties to eighties was approximately one and half times, increase

TABLE II—Common Pediatric Morbidity and Mortality

Year	Admission Pediatric	Diarrhea	Pneumonia	Tetanus	Pyogenic meningitis	Tuberculous meningitis	Encephalitis
<i>Morbidity</i>							
1958-58	11,393	2,013 (17.7)	1,977 (17.4)	-	199 (1.8)	248 (2.2)	679 (6.0)
1974-77	25,593	6,235 (24.4)	2,934 (11.5)	1,308 (5.1)	248 (1.0)	420 (1.6)	307 (1.2)
1984-87	31,187	5,285 (16.9)	3,173 (10.2)	1,297* (4.2)	1,160 (3.8)	541 (1.7)	192 (0.6)
p value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<i>Mortality</i>							
	Pediatric deaths						
1955-58	1,660	397 (23.9)	272 (16.4)	-	43 (2.6)	111 (6.7)	358 (21.6)
1974-77	3,242	511 (15.8)	439 (13.5)	675 (20.8)	87 (2.7)	192 (5.9)	179 (5.5)
1984-87	4,059	447 (11.0)	408 (10.1)	553** (13.6)	254 (6.3)	168 (4.1)	101 (2.5)
p value		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
<i>Mortality (Disease wise)</i>							
1955-58		(19.7)	(13.8)	-	(21.6)	(44.8)	(52.7)
1974-77		(8.2)	(15.0)	(51.6)	(35.1)	(45.7)	(58.3)
1984-87		(8.5)	(12.8)	(42.6)	(21.5)	(31.1)	(52.6)
p value		<0.001	<0.001	<0.001	<0.001	<0.001	NS

Figures in parentheses indicate percentages.

* Neonatal = 779; Postneonatal = 518. ** Neonatal = 486; Postneonatal = 67.

in total pediatric admissions was almost two and a half times over the same period. This may indicate that awareness towards child health has been increasing. However, an increase in total pediatric admission can be due to increase in number of deliveries or increase in number of admissions due to childhood illness. There was a significant increase in total pediatric admissions in seventies as compared to sixties. After that admission in pediatric wards as percentage of hospital admissions remained static, but a significant increase is noted when hospital deliveries are included. It is noteworthy that hospital deliveries are taking place at a higher rate which in turn is likely to reduce perinatal and neonatal mortality.

Overall pediatric mortality has come down significantly from 15.6% in 1965-68 to 11% in mid seventies and 10.8% in 1984-1987. This fall in perinatal mortality rates could be due to decrease in neonatal mortality rates in late sixties and early seventies after which it reached a plateau. The pediatric mortality excluding neonates gives information about the status of other childhood illnesses. This figure has also shown some fall since fifties but has remained same over last two decades being 14.6, 12.7, 13.1% in 1955-1958, 1974-1977 and 1984-1987 respectively.

The high mortality rate of 30-35% reported from an institution in Calcutta has subsequently come down to 20% in 1981(4,5). The pediatric mortality rates, for the present decade as reported by various workers are mostly in the range of 9-12%(4-9). It is apparent that while there were initial successes, for a breakthrough in the present static mortality rates, stronger interventions are required.

Diarrhea and pneumonia continue to be the leading causes of pediatric morbidity despite reduction in the incidence as

percentage of pediatric admissions. An increase in number of cases of pyogenic meningitis in 1984-1987 is due to meningococcal epidemic in Delhi during that period. But it is unfortunate that, a totally preventable disease like tetanus is still responsible for significant percentage of pediatric admissions. As many as 20.8% total pediatric deaths in 1974-1977 and 13.6% in 1984-1987 were due to tetanus. In tetanus majority of the deaths occurred in the newborn period. In 1984-1987 neonates accounted for 779 out of 1297 (60%) admissions and 486 out of 553 (87.9%) deaths. This should be a matter of concern to all.

Diarrhea, pneumonia and various central nervous system infections are the leading causes of pediatric mortality in eighties in most of the centres (*Table III*). The percentage of total deaths related to tetanus varied considerably and a higher rate in our series is probably due to large number of admissions of neonatal tetanus cases, our centre being a referral unit for such cases. It is possible that the actual number of cases in the community are declining, but increased awareness about the treatment facilities have kept the admission rate high. Admission rate of tetanus cases will probably go down only after a significant fall of such cases in the community. In the series of Basu *et al.*, one-fourth deaths were due to encephalitis, due to an epidemic during the study period(6). Morbidity statistics of short duration are often influenced by epidemics.

Any change in the incidence and outcome of various pediatric disorders will reflect the impact of various health programmes as well as of newer diagnostic aids and chemotherapeutic agents. It is quite encouraging to note that mortality with diarrheal disorders came down from 19.7% in 1955-1958 to 8.2% in 1974-1977

TABLE III—Mortality as Percentage of Total Deaths

Disease	Basu (1984)	Lokeswar (1980)	Deivanayagam (1985)	Present (1984-87)
Diarrhea	15.0	14.9	23.8	11.0
Pneumonia	11.3	13.4	*	10.1
Tetanus	--	4.8	8.8	13.6
Pyogenic meningitis	6.3	3.6	--	6.3+
Tuberculous meningitis	3.5	6.8	--	4.1
Encephalitis	24.0+	7.2	**	2.5

* Respiratory infections = 9.4%.

** CNS cases = 8.3%.

+ Epidemic

but since then it has not shown a further fall, being 8.5% in 1984-1987. Bose in 1956 reported 36.0-47.5% of mortality in patients with diarrhea and Basu *et al.* in 1981 reported mortality of 18.6% from the same institution(5,10). Various other workers observed mortality rate varying from 5.9 to 8.9% in these patients in the present decade(6,8,9). The significant fall in mortality of patients with diarrhea may be attributed to introduction of oral rehydration solution in addition to increasing parental awareness and early medical aid. However, overall incidence of diarrhea has not declined indicating the need for strengthening public health measures. Mortality in patients with pneumonia and tuberculous meningitis has also come down from 15.0 to 12.8% and 45.7 to 31.1%, respectively over the last decade. A mortality rate ranging from 5.9 to 19.6% has been reported in patients with pneumonia(5,6,8). However, outcome in encephalitis cases continue to remain totally unsatisfactory.

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NOTES AND NEWS

INDIAN COUNCIL OF MEDICAL RESEARCH AWARDS

Dr. R.K. Marwaha, Associate Professor in Pediatrics at the Post Graduate Institute of Medical Education and Research, Chandigarh is the recipient of Dr. H.B. Dingley Memorial Award of the Indian Council of Medical Research, 1990 for best research in Pediatrics. Heartiest congratulations from the Pediatric fraternity.

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Editor