

# Mortality Pattern in Children in General Pediatric Ward of Abbasi Shaheed Hospital Karachi

1. Ibrahim Shakoor 2. Riffat Ghazal 3. Muhammad Fareeduddin 4. Mohsina Noor

1. Asstt. Prof. of Pediatrics, KM&DC, Abbasi Shaheed Hospital, Karachi 2. Senior Registrar of Pediatrics, KM&DC, Abbasi Shaheed Hospital, Karachi 3. Consultant Paediatrician, Indus Hospital, Karachi 4. Asstt. Prof. of Pediatrics, National Institute of Child Health, Karachi

## ABSTRACT

**Objective:** To determine the different causes of mortality in children and to identify the risk factors associated with mortality.

**Study Design:** Descriptive Study.

**Place and Duration of Study:** This study was conducted in Department of Pediatric unit- I Abbasi Shaheed Hospital from April 2010 to March 2011.

**Materials and Methods:** All those infants and children who expired in unit I of Abbasi Shaheed Hospital were included. A previously prepared Performa was filled. The indicators studied were age, sex, total duration of hospitalization, total duration of illness and diagnosis of each infant and child, nutritional status and immunization status of all the children

**Results:** Out of 3420 patients 157 children expired .out of 3420 admitted patients 1789 were males and 1631 were females. Most of the children admitted were below the age of five years. 64 children expired within first 24 hours of admission. 56% were malnourished and 63% were either not immunized or had received only partial immunization. Infectious diseases were responsible for 67 % of all deaths. Malnutrition, non-immunization, late referrals were the risk factors identified.

**Conclusion:** In this study mortality was found to be 4.59 % and the risk factors identified were similar to other studies conducted in Pakistan and other third world countries. For the good management of patients and to decrease mortality it is suggested that awareness should be made in General practitioners, other health workers and general public for early referrals. Vaccination and malnutrition were major risk factors contributing to death effective strategies are recommended like community based health education campaigns.

**Key Words:** Mortality in Children, Risk factors, Nutritional status and immunization

## INTRODUCTION

Since UNICEF was founded, there has been a major change in global mortality. By far the greatest emergency facing the world's children today is the silent emergency of frequent infections and wide spread under nutrition. No Major Emergency, such as famine, drought or flood has ever killed 280,000 children in a week<sup>1</sup>. Yet that is what this silent emergency is now doing every week. More than 14 million children under five years of age die annually in third world<sup>2</sup>. In Pakistan about 3.5 million children are born every year. There are over 20 million children below five year of age. They are very vulnerable to disease and death, contributing to almost half of the mortality and bearing 3/5<sup>th</sup> of morbidity load in the community<sup>3</sup>. In Pakistan, 78 infants out of 1,000 live births die every year while under-five mortality is 94 deaths per 1,000 live births<sup>4</sup>. Nearly 8 million children died in 2010 before reaching the age of 5, largely due to pneumonia, diarrhea and birth complications<sup>5</sup>. Mortality rate especially infant mortality rate (IMR) are useful indicators of population health. High infant mortality suggests poor socioeconomic status but more specific information is

needed as to leading causes and major risk factor involved. This information is essential for determining effective action and preventive measures. The present study was conducted with aim to determine the risk factors in relation with infant and child mortality in the developing country like Pakistan.

## MATERIALS AND METHODS

This study was conducted over a period of one year from April 2010 to March 2011 in Department of Pediatrics Abbasi Shaheed Hospital Karachi. ASH is a tertiary care hospital. It was a descriptive study. The study has included infant and children who expired in pediatric ward during the study period. Sample technique was non probability convenience sampling. The Inclusion criteria was children from one month to fourteen years of age who were admitted through OPD or emergency in pediatric ward of ASH and expired during their stay in the ward during the study period of one year. Exclusion criteria includes children less than one month of age, children who were shifted to oncology ward and PICU and children suffering from gastroenteritis because children suffering from gastroenteritis are either treated in emergency or shifted

to Gastroenterology ward. In this study information regarding infant and children who died during the stay in ward were gathered. The detailed information was recorded on pre-designed proformas.

## RESULTS

A total of 3420 children were admitted in pediatric ward of AbbasiShaheed Hospital Karachi. The children were between the ages of one month to thirteen years. 1789(47.7%) were male and 1631(52.3%) were female. 2451(74.3%) of the admitted patient were below the age of five years and only 879 (25.7%) were above the age of five years.

Among the children below the five years of age 899 (26.3%) children were one month to six month of age, 498(14.5%) were six month to one year of age and (37.1%) were one year to five year of age. Of these 3420 admitted patients 3198(93.5%) were discharged after treatment. 157(4.6%) patient expired during their stay in ward. The outcome of 65(1.9%) patients is not known as they left against medical advice.

Out of these 157 expired patients, 40 patients were between ages of one month to six months, 29 were between six months to twelve months of age, 71 were between one year to five years of age and 17 were above five years of age. Table 1

Among the 157 expired patients 85 (53.69%) were males and 72 (46.3%) were females with an overall male to female ratio of 1.2:1. It was observed that almost twice number of male children expired compared to female in the age group one to six months. Beyond that age period no noticeable difference in mortality could be observed between male and female children.

Majority 99 (63%) were brought to the children emergency in critical state. Of these 51 (52%) died within first 24 hours of their admission. 38 (39 %) patient expired between 1 to 7 days, while 10 (9%) had duration of hospitalization of more than seven days (Range 8 -30 days before death.)

Duration of illness prior to admission was prolonged in majority of the children. There were 107 (68.4) who had 3 to more than 30 days of illness. Only 50 (31.6%) had duration less than 48 hours before admission.

It was observed that 72 (46%) of the children were referred by general practitioners GP's. Other mode of referrals are shown in Table 3.

Mild to severe malnutrition was noted in 58.6% of the children who expired. Most of these children were below two years of age, indicating the malnutrition is an important risk factor, especially in children below two years of age.

Among the 58.6% malnourished children, 16.8 % had first degree, 21.4% had 2<sup>nd</sup> degree, while 61.4% were having in 3<sup>rd</sup> degree malnutrition.

Immunization status of 118 (75.3%) of 157 expired patients were either not immunized or had received only partial immunization. Only .8 % of children had vaccination record. Table 2

In this study it was noted that 65% of all deaths were due to infectious diseases namely diarrhea respiratory CNS measles and sepsis.

Respiratory tract were the leading cause of mortality in our study, the death figure being 45 Fig 1

CNS infection (Meningitis, Encephalitis and Tuberculosis - Meningitis) were second in the line killing 41 (20%) children. Among these CNS infections, meningitis took the lives of 24 patients. Encephalitis claimed 10 lives, while TBM was responsible for 7 deaths, Figure 1

Sepsis still remains one of the major causes of death especially in children below 6 months of age; it is responsible for killing 22 (11%) children, mostly below 6 months of age. Fig 1

Our evaluation revealed that out of 157 total death 12.7% were due to two major complications of measles that is, measles pneumonia and measles encephalitis, claiming 13 and 7 lives respectively. Fig 1

Eleven (3.8%) children died due to Hepatic disease

Mortality in children due to accidental poisoning was 7 (3.5%) Kerosene oil poisoning was the commonest infant followed by insecticides.

Hence malnutrition, late referrals and non – immunization were observed as the most common risk factors in all those children who expired.

**Table No. 1: Age and sex distribution of expired patient**

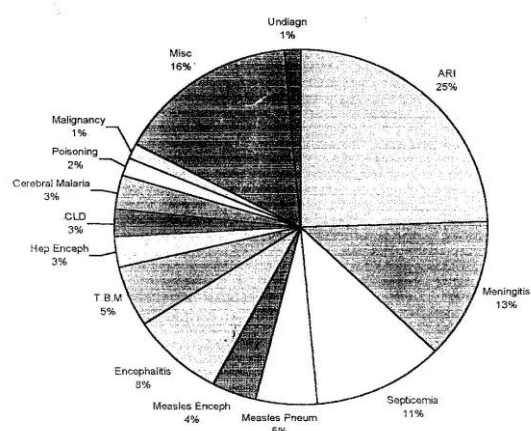
Age (Months)	Male	Female	Total	M/F Ratio
1 – 6	26	14	40	1.8 : 1
7 – 12	16	13	29	1.2 : 1
13 – 59	37	34	71	1.0 : 1
More than 60 Months	9	8	17	1.1 : 1
Total	88	69	157	1.2: 1

**Table No. 2: Immunization Status of Expired Children**

Vaccination Status	Total	Percentages
Completely vaccinated	58	37 %
Unvaccinated	31	20 %
Partially Vaccinated	68	43 %
Total	157	100

**Table No.3: Modes of Referral**

Modes of Referral	Total Number of Patients	Percentages
Brought Directly to ASH	38	24 %
By General Practitioners	72	46 %
By other Hospital and Centers	29	18 %
Others (Hakims, Homopaths, etc)	18	12 %
Total	157	100



**Figure No.1: Frequency of different diseases**

## DISCUSSION

In this study 157 number of patients expired during one year duration and the total number of admitted patients were 3420 accounting for a total mortality of 4.56%. Other studies which were conducted in Pakistan and in other South East Asian countries were high compared to this study. A study conducted in civil hospital where Mehnaz and Billoo found mortality of 16 %<sup>6</sup>. The logical reason for high mortality in other studies could be the inclusion of neonates and diarrheal mortality which were not included in our study.

High mortality was observed in children who were below five years of age. These findings are consistent with majority of studies conducted in developing countries<sup>7</sup>.

A survey was conducted by World Fertility Survey in 29 countries and they found most of the children died before reaching five years of age especially in countries like Pakistan, Nepal and Bangladesh<sup>8</sup>.

A male to female ratio of 1.2 : 1 was found in this study. WHO states that in most populations, female infants have lower mortality than their counterparts<sup>9</sup>.

This is in contrast to a study published in India. Khanna R, Kumar and Pulyel noted that mean infant mortality was 1.3 times higher in females than in males<sup>10</sup>.

Khalique N, Sinha SN, Yunus N and Malik AE. Reported similar result<sup>11</sup>.

The study shows that acute respiratory tract infection was the leading cause of death in infants and children. About 25% patients expired due to respiratory infections.

A study conducted in Pakistan shows ARI was the leading cause of mortality among children.<sup>12</sup>

Khan M, A Rehman, G N and Qaazi S. A reported similar results<sup>13</sup>. Robert M. Douglas and Rennie M. Dsouza, also reported that acute respiratory infections are the leading cause of death in countries where mortality is high<sup>14</sup>.

ARI mainly pneumonia accounts for more than 18% of deaths in developing countries<sup>15,16</sup>.

WHO reports that ARI kill more children under five than any other infectious disease accounting for almost 2 million deaths a year among this age group<sup>17</sup>.

In 80% to 90% of cases the problem is bacterial pneumonia which can be controlled by proper use of antibiotics. Parents can be educated to recognize the first danger signs, and community health workers can be trained to diagnose pneumonia, prescribing correct antibiotics and early referrals. In addition about 20% of acute respiratory infections could still be prevented by immunization<sup>18</sup>.

CNS infections are also one of the leading causes of mortality after ARI. CNS infections were the second main cause of mortality after ARI. Trevor Duke reported an incidence of 38 to 110 cases each year per 100,000 of population age less than five years and case fatality of 22% to 45<sup>19</sup>.

In this study sepsis took the life of 11% children, most children were between one to six months of age.

Today more than 200,000 cases of sepsis occur in United States with a mortality ranging 20 to 50% each year<sup>20</sup>.

Most of us are aware of the risk posed by measles to children's health. In this study majority of children who were suffering from measles die due to measles pneumonia.

Iqbal H and Jamil T from Lahore reported 18 % mortality from measles complications, in which respiratory complications were the most common<sup>19,21</sup>.

Some important observations regarding measles were noted. First, that most cases of measles were reported during the first three months i.e. from January to March. The second, that most of children who were admitted with the diagnosis of measles were vaccinated. Salahudin, Qadir M and Shah MZ also reported higher incidence of measles in winter as compared to summer<sup>19</sup>.

Poisoning although accidental, but still important cause mortality in children. In this study poisoning contributes for about 3% of mortality.

Kerosene oil poisoning was on the top followed by organophosphate poisoning but most children expired due to organophosphate poisoning.

Baloch GR, Hussain W, Malik A and Haider A in a study from Shikhar Zayed Hospital reported 8% mortality<sup>22</sup>.

Malnutrition is a major problem in children, especially of the third world. In this study 58% children were having some degree of malnutrition.

Of the nearly 12 million children under five who die each year in developing countries mainly from preventable causes, the death of over 6 million or 55% are either directly or indirectly attributable to malnutrition<sup>23</sup>.

A study conducted in Lahore by M. Akbar<sup>24</sup> which showed more than 60% children were malnourished who expired during their study.

Delay in seeking early medical care is an important detrimental factor resulting in high mortality. It is suggested that awareness should be created among general public so they can use simple and effective e

treatments for minor illness, seek care early and to persist with treatment.

Around 2.5 million under-five deaths are averted annually by immunization against diphtheria, pertussis and tetanus (DPT) and measles<sup>25</sup>.

In 2010, over 19 million children did not get all three primary doses of DPT vaccination.<sup>25</sup>

All the health workers in developing countries are aware of the importance of immunization. So it is emphasized to improve immunization status of children through EPI programme.

## CONCLUSION

In this study mortality was found to be 4.59% and the risk factors identified were similar to other studies conducted in Pakistan and other third world countries. For the good management of patients and to decrease mortality it is suggested that awareness should be made in general public. General practitioners and other health workers should be trained for correct diagnosis, proper treatment and early referrals.

Vaccination and malnutrition were major risk factors contributing to death effective strategies are recommended like community based health education campaigns.

To reduce the mortality we third world countries have to follow the simple inexpensive, and acceptable methods, the European countries have adopted 50 years ago and achieve sticking decreases in their mortality.

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