

# Causes of under five mortality: A study at tertiary care center

J D Bansode<sup>1\*</sup>, S P Andurkar<sup>2</sup>, L T Chinte<sup>3</sup>, A S Nagoankar<sup>3</sup>, J V Dixit<sup>3</sup>

<sup>1</sup>Jr. Resident, <sup>2</sup>Associate Professor, <sup>3</sup>Assistant Professor, <sup>3</sup>Associate Professor, <sup>3</sup>Professor and HOD, Department of Community Medicine, Government Medical College, Latur, Maharashtra, INDIA.

Email: [dr.jdbansode@gmail.com](mailto:dr.jdbansode@gmail.com)

## Abstract

**Background:** Children are the promise and the future of every nation, being the core of its development. Investing in children's health and development means investing in the future of a nation. Child mortality is a critical measure of the wellbeing of children and a good proxy indicator of the overall level of development. In-depth analysis of death of children provides valuable information. **Objective:** The objective of the study was to find out different causes of under five mortality in tertiary care center at Government Medical College and hospital, Latur, Maharashtra. **Methods:** This Study design was retrospective record based cross sectional study. 1 year data from January 2015 to December 2015 was studied. All under five deaths occurred in admitted children in Government Medical college and hospital, Latur during the study period were included in the study; The causes of deaths were studied and ICD-10 was applied. The data was analyzed using appropriate statistical tool. **Results:** Total patient admitted in pediatric department in year 2015 were 4524. Total under five admitted were 2942 of this 1952 (57.44%) were males and 990 (42.56%) were females. Male: Female admission ratio was 1.97. Total deaths in under five were 257. The major causes of mortality were found to be infection (29.96%), respiratory distress syndrome (12.84%) prematurity (11.28%) birth asphyxia (8.94%). **Conclusion:** This study identified infections, respiratory distress syndrome, prematurity, birth asphyxia, meconium aspiration syndrome as major causes of mortality of under five children. Improving antenatal care, maternal health and timely referral of high risk cases to tertiary care hospital will help to improve outcome.


**Keywords:** Under five mortality, ICD-10, medical records.

## \* Address for Correspondence:

Dr. J D Bansode, Jr. Resident, Department of Community Medicine, Government Medical College, Latur, Maharashtra, INDIA.

Email: [dr.jdbansode@gmail.com](mailto:dr.jdbansode@gmail.com)

Received Date: 29/04/2016 Revised Date: 25/05/2016 Accepted Date: 06/06/2016

Access this article online	
Quick Response Code:	Website: <a href="http://www.medpulse.in">www.medpulse.in</a>
	DOI: 10 June 2016

## INTRODUCTION

Child mortality particularly Under five mortality and infant mortality is a leading indicator of the level of child health and overall development in countries.<sup>1</sup> UNICEF considers under five mortality rate as the single best indicator of social development and well-being rather than per capita GNP<sup>2</sup>. 5.9 million children under age five died in 2015, 16 000 every day, 11 every minute. Globally, under-five mortality rate has decreased by 53%,

from an estimated rate of 91 deaths per 1000 live births in 1990 to 43 deaths per 1000 live births in 2015<sup>3,4</sup>. Currently, 79 countries have an under-five mortality rate above 25, and 47 of them will not meet the proposed Sustainable Development Goals/SDG target of 25 deaths per 1000 live births by 2030 if they continue their current trends in reducing under-five mortality<sup>4</sup>. Without a sound knowledge about the changing trends in morbidity and mortality, it will be difficult to formulate appropriate strategies in management, prevention and review<sup>5</sup>. Accurate and timely information on the causes of child deaths is essential in guiding efforts to improve child survival<sup>6</sup>. Hospital based data about mortality provides information about death cause as well as in-depth analysis shows direct or indirect factors related to the death. This information helps the administration to see the pattern of deaths and interventions needed to control it at hospital level.<sup>7</sup> With this perspective the present study was conducted to find out different causes of under five mortality in tertiary care center.

## MATERIAL AND METHODS

It was a retrospective record based, cross sectional study conducted in the medical record section of department of community medicine, Government Medical College and hospital, Latur. All under five deaths occurred in admitted children in Government Medical College and Hospital, Latur during the study period of one year from January 2015 to December 2015 were included in the study. Variables such as age, sex, address, weight at the time of admission, birth weight, duration of hospital stay and cause of death which were recorded in a predesigned format. The underlying cause of death as written on case records and certified by treating pediatrician was considered as the final cause of death. The causes of deaths were studied and ICD-10 was applied.

## RESULTS

Total patient admitted in pediatric department from January - December 2015 were 4524. Out of this 4524 total under five children admitted were 2942, out of this 1952 (57.40%) were males and 990 (42.60%) were females. Male:Female admission ratio was 1.97. Out of 2942 under five admissions 257 deaths occurred in admitted children in Government Medical College and hospital, Latur during the study period of one year from January 2015 to December 2015.

**Table 1:** Age and Sex wise distribution of study population

Age	Male (%)	Female (%)	Total (%)
7 Days	111 (56.06)	87 (43.94)	198 (77)
7 – 28 Days	06 (60)	04 (40)	10 (03.90)
1 Month- 1 Year	12 (44.44)	15 (55.56)	27 (10.50)
1 Year – 5 Year	16 (72.72)	06 (27.28)	22 (08.60)
<b>Total</b>	<b>144 (56.03)</b>	<b>113 (43.97)</b>	<b>257 (100)</b>

Table 1 shows the age and sex wise distribution of study population. Out of 257 under five deaths 198 (77%) deaths were found in early neonates (Table 1). Deaths in late neonates were found to be 10 (03.90%), in infants were 27(10.50%) and in age group between 1-5 years it was 22 (08.60%) (Table 1). So from this study we have found that most number of deaths 208 (80.90%) have occurred in neonatal period (Table 1). 56.25% of neonatal deaths were seen in males and females formed remaining 43.75 % neonatal deaths (Table 1).

**Table 2:** Distribution of study population according to mean time interval between admission and death

Time Interval	Number of Deaths	Percentage (%)
24 hours	92	35.80
24 – 48 hours	84	32.70
> 48 – 120 hours	44	17.10
> 120 hours	37	14.40
<b>Total</b>	<b>257</b>	<b>100</b>

Study also found that majority i.e. 35.80% deaths occurred within 24 hours after admission to the hospital (Table 2). While 32.70 % deaths occurred within 24-48 hours after admission 17.10 % deaths occurred after 48-120 hours and 14.40 % deaths were seen after 120 hours after admission to the hospital (Table 2).

**Table 3:** Distribution of study population according to Age and Causes of mortality and ICD-10

Causes of Mortality	ICD – 10	0-7 Days	7-28 Days	1 Months-1 Year	1 Year-5 Year	Total (%)
INFECTION						77 (30)
SEPTICEMIA	A-41.9	30	02	02	01	35
PNEUMONIA	J-18	10	05	05	05	25
MENINGITIS	A-87.9, G-00.9	08	01	02	01	12
VIRAL ENCEPHALITIS	A-86	00	00	03	02	05
RDS	P-22.0	33	00	00	00	33 (12.80)
PREMATURITY	P-07.3	26	02	01	00	29 (11.30)
BIRTH ASPHYXIA	P-84	23	00	00	00	23 (08.90)
MAS	P-24.01	22	00	00	00	22 (08.60)
OTHER *	G-40.91,P-05.9,R62.51,P77.9,D-65	46	00	14	13	73(28.40)

ICD 10- International Classification of Diseases 10. Figures in parenthesis are percentages. A-87.9 Viral meningitis NOS/G-00.9 Bacterial meningitis unspecified/A-86 Viral encephalitis/J-18 Pneumonia unspecified organism/A-41.9 Septicemia NOS/P- 22.0 respiratory distress syndrome of newborn/P- 07.3 Prematurity NOS/P-84 Asphyxia of newborn NOS/P-24.01 Meconium aspiration syndrome NOS/G-40.91 Epilepsy unspecified intractable with status epilepticus/P-

05.9 Newborn affected by slow intrauterine growth unspecified/R-62.51 Failure to thrive in child over 28 days old/P-77.9 Necrotizing Entero Colitis in newborn unspecified/D-65 Disseminated intravascular coagulation/OTHER\* includes Status epilepticus G-40.91, IUGR P-05.9, Failure to thrive R-62.51, Necrotizing entero colitis P-77.9, DIC D-65 etc. The major causes of under five mortality were infection(29.96%), respiratory distress syndrome

(12.80%) prematurity (11.30%) birth asphyxia (08.90%) and meconium aspiration syndrome/MAS (08.60%) (Table 3). The study have found that the major causes of under five mortality were infection (30%), respiratory distress syndrome (12.80%) prematurity (11.30%) birth asphyxia (08.90%) and meconium aspiration syndrome/MAS (08.60%) (Table 3). Among infectious causes septicemia 62.50% was the most common cause of deaths in early neonate, and overall most common cause in early neonatal period was respiratory distress syndrome 12.80% (Table 3). In this study pneumonia was found to be most common cause of death in late neonates, infants and children between 1-5 years i.e. 50%, 18.50% and 22.70% respectively (Table 3).

## DISCUSSION

In present study early neonatal deaths in males (56.10%) were more than the females (43.90%) this shows greater biological vulnerability of males than females. Similar findings were seen in studies done by Gulati P<sup>9</sup>, Godale L. Mulage S<sup>11</sup>, Naik J<sup>13</sup>. In present study neonatal deaths were found to be 80.90% of all under five deaths, This finding is more compared to studies of Patil A, Borde A.<sup>7</sup> (74.40%), Patil S, Godale L.<sup>8</sup> (57.95%) and Naik J.<sup>13</sup> (80.70%). In present study, 91.43 % deaths occurred within one year of age as which is consistent with findings of studies done by Patil S.W, Godale L.B<sup>8</sup>, Gulati P<sup>9</sup>, Deivanayagam N<sup>10</sup>. About 35.80% of under five deaths occurred within 24 h of admission in this present study, which could be attributed to delayed transportation of patients and referral in critical conditions as Godale L. Mulage S<sup>11</sup>, Deivanayagam N<sup>10</sup>. and Roy R<sup>12</sup>. supported this finding in their studies. In this study in all age groups male children had more percentage of death except from 1 month to 1 year age group where female child is at more risk this may be because more male admissions and low health care attention towards female child than male child, similar results were seen in a study done by Patil A, Borde A<sup>7</sup>. In present study Infection was found to be the most common cause of under five mortality, similar findings noted in studies done by Shukla S<sup>1</sup>, Patil S, Godale L<sup>8</sup>

## CONCLUSION

Present study identified infections, respiratory distress syndrome, prematurity, birth asphyxia, meconium aspiration syndrome as the major causes of the under five mortality. Improving antenatal care, maternal health and timely referral of high risk cases to tertiary care hospital will help to improve outcome.

## LIMITATIONS

It was a retrospective hospital record based study; so the results cannot be extrapolated or generalized. As it was a record based study Maternal factors, delay of referral, time lag between onset of symptoms and admission in the hospital and could not be studied.

## REFERENCES

1. Shukla S, Das D, Behera J, Journal of Dental and Medical Sciences. Post Neonatal Under Five Mortality – A Hospital Based Study. Volume 14. Issue (2) Ver. VIII. Feb. 2015; p 42-45.
2. Park K, text book of preventive and social medicine, Jabalpur, Bhanot publishers, 23<sup>rd</sup> edition; p 572-573
3. UNICEF [Internet] [place unknown], UNICEF data : Monitoring the situation of children and women [date unknown]. [Updated: Oct 2015, cited 2016 Feb 5 ] available from <http://www.data.unicef.org/child-mortality/under-five.html#sthash.2Oxiqflg.dpuf>
4. WHO [Internet] [place unknown], WHO Global Health Observatory (GHO) data [date unknown]. [cited 2016 Feb 6 ] ; available from [http://www.who.int/gho/child\\_health/mortality/mortality\\_under\\_five\\_text/en/](http://www.who.int/gho/child_health/mortality/mortality_under_five_text/en/)
5. Ramadurg U, Ghattargi C, Gagan S et al, International Journal of Health Information and Medical Research. A Study of Causes of Neonatal Mortality in Tertiary Care Hospital, Bagalkot. Vol: 1, Issue: 2, April 2014.
6. Thembelihle N, Ntambwe M, Marianne A, Global Journal of Health Science. Causes of Deaths in Children under-Five Years Old at a Tertiary Hospital in Limpopo Province of South Africa. Vol. 5, No. 3; Published by Canadian Center of Science and Education, 2013
7. Patil A, Borde A, Journal of Evolution of Medical and Dental Sciences. Study the Cause of Death and its some factors among Hospitalized Paediatric Cases at a Tertiary Care Centre of Rural District Of Maharashtra, India, Vol. 3, Issue 02, January 14; p 313-321.
8. Patil S, Godale L, National Journal of Community Medicine | mortality pattern of hospitalized children in a tertiary care hospital in latur: a record based retrospective analysis Volume 4, Issue 1, Jan – Mar 2013
9. Gulati P, Mortality rate and causes of deaths among children below five years. Indian Pediatr 1967; p 34:235.
10. Deivanayagam N, Shivarathinam S, sankaranarayanan V. Mortality and morbidity pattern of the hospitalized children at madras city. Indian J Pediatr; 1987; p 733-737.
11. Godale L. Mulage S, Trend And Pattern Of Paediatric Deaths In Tertiary Care Hospital Solapur, Maharashtra. Indian J MCH 2012; p2-10.
12. Roy R, Nandy S, Shrivastava P, Chakraborty A, Mortality pattern of Hospitalized Children in a Tertiary Care Hospital of Kolkata. Indian J Community Med 2008; 33; p 187-189.
13. Naik J, Dolare I, Jatti G et al, International Journal of General Medicine and Pharmacy (IJGMP). mortality pattern among hospitalized children in a tertiary care hospital of western maharashtra, Vol. 3, Issue 6, Nov 2014; p 7-12.

Source of Support: None Declared  
Conflict of Interest: None Declared