

A Retrospective study of under-five mortality at tertiary care hospital

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Abstract

Purpose: Though under five mortalities started declining in India with the developing technologies and various preventive measures yet it alarms India by standing in third place in death rate. Hence it is necessary to knockout the measures to stop under five mortalities in our country.

Aim: The main of the study is to unravel the causes of under-five mortalities in a tertiary care hospital

Materials & Methods: Five-year data of children who died at paediatric Intensive Care Unit were included for the present study. The history of the children was collected and data was analysed.

Results: Among 5355 children who were born in 5-year duration, 247 were found to be dead. The major causes of neonatal deaths were found to be respiratory distress syndrome, perinatal asphyxia, meconium aspiration and sepsis. The minor causes were congenital anomalies and others. Causes of child and infant death include pneumonia, dengue and sepsis.

Conclusion: To conclude, in the present study male children were affected more than the female children and major causes were found to be infections and respiratory problems. And our study stands as one of the novel studies in determining the causes of under-five mortalities.

Keywords: mortality, infections, respiratory disorders

Introduction

Under-five mortality is a vital pointer of population health which is strappingly related to structural factors like financial status, societal well being and ecological aspects. It is defined as the percentage of death rate after birth rate until the age of five per 1000 live births.[1] It stands as an important indicator of economic growth in the emerging countries that replicates the quality of life and health care status. Though under-five mortality rate has started declined from last three decades which has dropped from 12.5 million deaths to 5.9

million deaths, yet India contributes to about one-third of these deaths.[2] From the years 1992-93 to 2015-16, India has witnessed 54% reduction in mortality rates. In spite of all the efforts, under-five mortality has to be declined to 25 deaths per 1000 live births by 2030. [3]

Maternal nutrition, birth complications, economically poor children, intrapartum related issues and other relevant infections are the leading causes of under-five mortality. Various geographical and economic factors also influence the survival of children. Even though there is a decline in under-five mortality yet few geographical disparities exist in India. [4] This has created a gap to explore various other causes of under-five deaths for enhancing child survival programmes. Targeted maternal interventions and knowing the causes of child death may prevent the mortality rates all over the world. Previous studies reported that, child mortality is associated with various factors. Therefore, in the present study we aimed to find out the causes of under five children mortality rate.

Materials & Methods

The study used data from the medical records of RL Jalappa Hospital. The study population includes, children of age group 1-5 years who died at Paediatric Intensive Care unit during the years June 2017 to June 2022. The children who died immediately after arriving to emergency unit were excluded from the study. All the details of the study samples like socio-demographic profile, clinical characteristics of the disease, cause of death, length of ICU stay, the date and time of death were reviewed. The collected data was entered in Ms Excel and analysed using SPSS 22 version software. The results obtained were tabulated.

Results

A total of 5355 children list was obtained from MRD and out of which 247 samples were found died in paediatric Intensive care unit of RL Jalappa Hospital and Research Centre. The data collected was segregated according to gender and age and are tabulated in the below given table and graph.

Table 1: Descriptive analysis of death by age and gender among under-five children

Age of the child	No. of male deaths	No. of female deaths	Total	Percentage
< 28 days	74	60	134	54.20%
1 month-1 year	46	34	80	32.40%
1-5 years	17	16	33	13.40%
Total	137	110	247	100%

Among the 3 categorised age group of under-five children, significant number of neonatal deaths were noted in age group of < 28 days with a percent of 54%. It was also noted that, between male and female gender, male children death rate was significant.

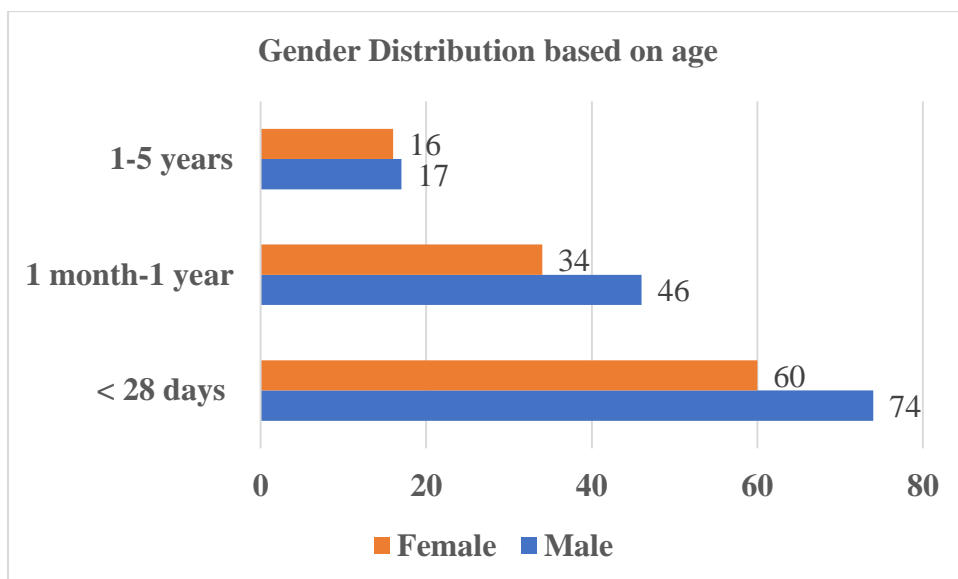


Fig 1. Bar diagram showing distribution of gender based on age and sex

Table 2: Major causes of neonatal deaths

Cause	Frequency	Percentage
Respiratory distress Syndrome	44	32.8%
Perinatal Asphyxia	23	17.2%
Meconium Aspiration	14	10.4%
Sepsis	17	12.7%
Necrotizing Enterocolitis	4	2.9%
Congenital heart disease	11	8.3%
Congenital anomalies	9	6.8%
Others	12	8.9%
Total	134	100%

From the obtained data, the major causes of neonatal deaths were as follows. Respiratory distress syndrome in 32.8% neonates, Perinatal Asphyxia in 17.2% neonates and Sepsis in 12.7% neonates.

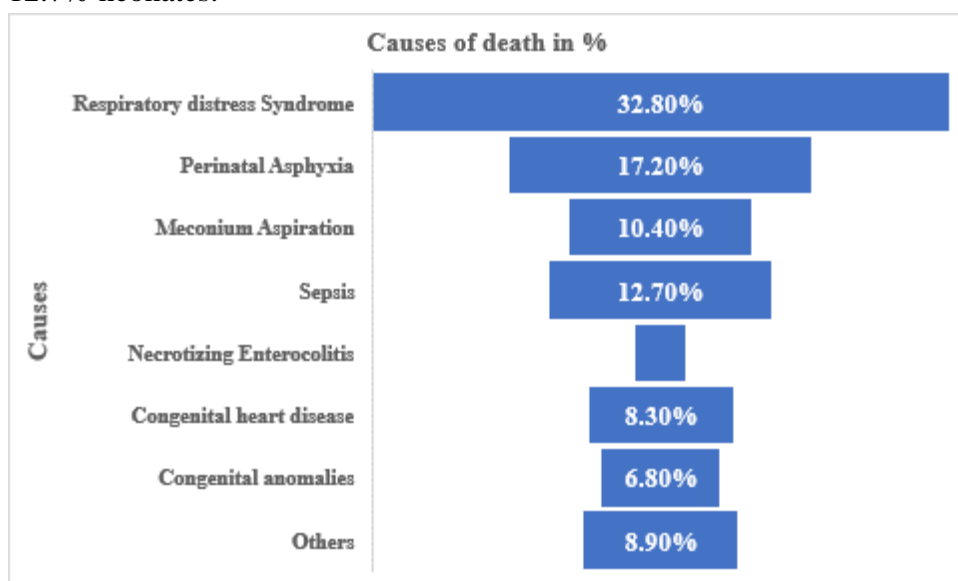
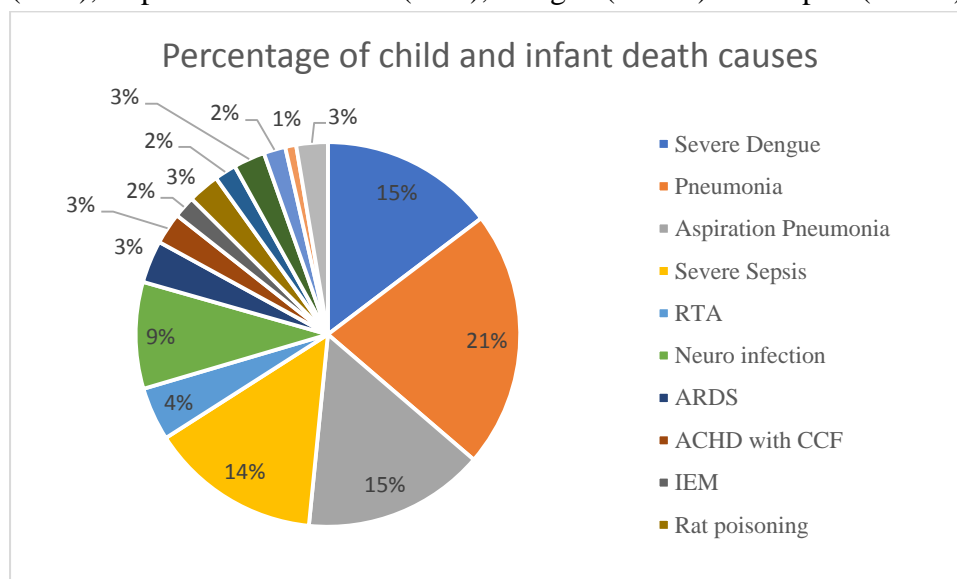


Fig 2. Causes of neonatal deaths represented in %**Table 3: Major causes of child and infant death**

Cause	Frequency	Percentage
Severe Dengue	16	14.4%
Pneumonia	24	21.2%
Aspiration Pneumonia	17	15%
Severe Sepsis	16	14.1%
RTA	5	4.4%
Neuro infection	10	8.8%
ARDS	4	3.5%
ACHD with CCF	3	2.6%
IEM	2	1.8%
Rat poisoning	3	2.6%
Type 1DM in DKA	2	1.8%
Drowning	3	2.6%
Snake bite	2	1.8%
Severe diarrhoea with SAM	1	0.9%
Others	3	2.6%

Among the death rate of infant and children, the major causes were found to be Pneumonia (21%), Aspiration Pneumonia (15%), Dengue (14.4%) and Sepsis (14.1%).

**Fig 3. Causes of child and infant deaths represented in %**

Discussion

Under-five mortality rate signifies children who die before attaining the age of 5 per 1000 live births.[5] The signs of live birth include breathing, heartbeat, voluntary muscular movements of the new born after separating from the mother. In many low- and middle-income countries (LMICs) majority of deaths are preventable.[6] According to the literature, the causes of death under five-year-old are acute respiratory infections, birth complications, diarrhoea and malaria. One of the major causes of death include malnutrition. [7]

Child mortality under-five is divided into several subgroups that include neonatal mortality that covers the phase of birth to first month of life, infant mortality that covers the phase from birth to first year of life and child mortality that covers the phase of 1-5 years of age. Among all the groups, neonatal group has the highest death rate. [8]

Under-five mortality remains high in low-income countries located in sub-Saharan Africa with mortality rate of one in 13 children, which is 15-20 times higher than the rate observed in developed countries. Though there are countries like sub-Saharan Africa, Central and South Asia that account for 50% of mortality of under-five, on contrary nearly half of under-five deaths occurred in Nigeria, Ethiopia and India. [9,10]

Hence, the present study aimed at finding the causes of under-five neonatal deaths. Studies proved that under-five mortality assumed to be less in mothers who are educated in Sub-Saharan Africa and southern Asia. Other study reports proved that there was significant association between low maternal education and poor child health conditions.[11] These observations were correlated with our study results as well.

A prospective study conducted in Delhi, also found increased risk of mortality in children of old mothers.[12] This observation is in co-ordination with the present study observations as well. Another important finding of our study is that higher rate of mortality is noted in boys than in girls which is similar to the other study observations. These difference in mortality in boys is due to the genetic makeup of boys who are found more susceptible to infections and pre-mature death. [13]

To our knowledge, this study seems first to systematically examine the causes of mortality in under 5 children in southern part of India in a tertiary care hospital. The most common causes of death include Pneumonia and sepsis followed by other infections in children and infants. In neonates, the common causes encountered were respiratory distress syndrome, perinatal asphyxia and Meconium aspiration, which is a novel observation of the study. The major limitations of the study were, the study population is restricted to only one hospital.

Conclusion

Despite the limitations, this was the first study in southern part of India to demonstrate various causes of mortality in under five children. Most of neonatal deaths were noted in male child than in females and the common causes include infections and respiratory disorders. Further studies on large number of populations would assist in ruling out the better causes of neonatal mortality rates.

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