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Department of Forensic Medicine & Toxicology, Third Floor, Library Building, Seth G S Medical College & KEM Hospital, Parel, Mumbai, Maharashtra, India. Pin-400 012. Email id: [mlameditor@gmail.com](mailto:mlameditor@gmail.com) Phone: 022-24107620 Mobile No. +91-9423016325.



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## Original Research Article

### **The Profile of Fetal and Infant Mortality in South-western Maharashtra Population: A Preliminary Study.**

Laxman Gangadhar Phad<sup>a\*</sup>, Rajesh V. Bardale<sup>b</sup>, Sandeep V. Haridas<sup>b</sup>

<sup>a</sup>Associate Professor, Forensic Medicine, BKL Walawalkar Medical College, Chiplun, Ratnagiri, Maharashtra, India. <sup>b</sup>Associate Professor, FMT, Government Medical College & Hospital, Miraj, Sangli, Maharashtra, India.

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#### Abstract

**Background:** Fetus is the unborn offspring that develops from an animal embryo. Infant mortality rate is the probability of a child born in a specific year or period dying before reaching the age of one year. Fetal mortality remains a significant and understudied problem that accounts for 50% of perinatal death. High infant mortality rates are generally indicative of unmet human health needs in sanitation, medical care, nutrition, and education. The present study was undertaken to understand the cause of fetal and infant deaths in terms of age, sex, area of residence, pathological conditions and injuries contributing to death. **Material & Methods:** The present cross-sectional retrospective study was carried out on 34 deceased fetus and infants brought for postmortem examination to Government Medical College and Hospital from January 2018 to December 2019. **Results:** In the present study female cases (55.88%) were more than males (44.12%). 12 cases (35.29%) were fetuses 11 cases (32.35%) were neonates of age group from birth to 28 days and 11 cases (32.35%) were infants of age group 29 days to 1 year age. 19 cases (55.88%) belong to the rural area and 11 cases (32.35%) belong to the urban area. The most predominant cause of death was fetal death (35.29%) followed by pneumonia (29.41%) meconium aspiration (11.77%) congenital anomalies (8.82%) and amniotic fluid aspiration (8.82 %). **Conclusion:** The most predominant cause of death in the present study was pneumonia followed by fetal death. The female deaths were more common than male deaths.

#### 1. Introduction

Fetus is the unborn offspring that develops from an animal embryo. The term infant is applied to very young children from birth to one year of age. The Infant mortality rate is the probability of a child born in a specific year or period dying before reaching the age of one year.<sup>1</sup> Foetal mortality

remains significant and understudied problem, that accounts for 50% of perinatal death.<sup>2,3</sup> It is an important indicator of the overall physical health of the community. Preserving the lives of newborns has been a long-standing issue in public health, social policy and humanitarian endeavours.

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\*Corresponding author: Dr Laxman Gangadhar Phad, Associate Professor, Forensic Medicine, BKL Walawalkar Medical College, Chiplun, Ratnagiri, Maharashtra, India. Email: [laxmanphad87@gmail.com](mailto:laxmanphad87@gmail.com) (M): +91-919421381771.

High infant mortality rates are generally indicative of unmet human health needs in sanitation, medical care, nutrition, and education. The infant mortality rate is an age-specific ratio used by epidemiologists, demographers, physicians, and social scientists to better understand the extent and causes of infant deaths.<sup>4</sup> Globally, about 15,000 children die every day. Child mortality rates have declined in all the parts of world, but still it is not on track of reaching the sustainable development goals for child mortality. In countries like Iceland, Japan, Monaco etc. with best health facilities, child mortality rates are ten times lower than the global average suggests that most of these child deaths are preventable.<sup>5</sup>

Monaco, Iceland and Japan are among the top three countries with the lowest infant mortality rates with around 2 infant deaths per 1,000. Additionally, the countries with the highest density of physicians also generally report low infant mortality.<sup>6</sup> As far as India is concerned, in 2018, one in 28 infants died in rural areas and one in every 43 infants died in urban areas with national average of 1 in 31 infants. In rural areas, the infant mortality rate was lowest in Chandigarh (4 cases) and Nagaland (5 cases) and highest in Madhya Pradesh (52 cases) and Uttar Pradesh (46 cases). In urban areas, the infant mortality rate was highest in Mizoram (2 cases) and Nagaland (3 cases) and highest in Madhya Pradesh (36 cases) and Uttar Pradesh (35 cases).<sup>7</sup> The infant mortality rate in Maharashtra fell gradually from 48 deaths per 1000 live births in 1999 to 19 deaths per 1000 live births in 2018.<sup>8</sup>

One of the most important purposes of infant and foetal autopsy is to find out the cause of death, which may provide the valuable information about various aspects of infant and fetal death. But in developing countries like India, it is very difficult to gather the actual data because most of the deaths including infant death goes unnoticed and not medically certified. The present study was undertaken to understand the cause of foetal and infant deaths in terms of age, sex, area of residence, pathological conditions and injuries.

## 2. Material and methods:

The present cross-sectional study was carried out on a total 34 deceased foetus and infants brought for postmortem examination to Government Medical College and Hospital from January 2018 to December 2019. These cases were either brought dead cases or

admitted cases of this or outside hospital. The brought dead cases includes neonates and aborted fetus found near railway station, roadside, in secluded places with intention to conceal the birth. The fetus and infants were studied after postmortem examination in terms of age, sex, area of residence, pathological conditions, and injuries to ascertain the cause of death and to highlight the factors associated death. Wherever available the histopathological examination reports were studied to ascertain the definite cause of death. The consent for study was not taken from relatives as it is retrospective study and data is anonymised.

## 3. Results:

Among the cases examined, 15 cases (44.12%) were male and 19 cases (55.88%) were female (Table 1).

**Table 1: Showing distribution of cases as per gender of infants.**

Sex	No of cases	Percentage
Male	15	44.12
Female	19	55.88
Total	34	100

**Table 2: Showing distribution of cases as per age of infants.**

Age	No of cases	Percentage
Fetal Death (Before birth)	12	35.29
0-28 days (Neonate)	11	32.35
29 days – 1 year (Infant)	11	32.35
Total	34	100

**Table 3: Showing distribution of cases as per area of residence.**

Residence	No of cases	Percentage
Rural	19	55.88
Urban	11	32.35
Not known	4	11.77
Total	34	100

12 cases (35.29%) were fetuses 11 cases (32.35%) were neonates of age group from birth to 28 days and 11 cases (32.35%) were infants of age group 29 days to 1 year age. In one fetus proper age could not be determined due to dismembered body parts brought for autopsy examination (Table 2). Among the study individuals 11 cases (32.35%) belongs to the urban area, 19 cases (55.88%) belongs to the rural area and in 4 cases (11.77%) area of residence were not known as they were found roadside or near the railway station or secluded places (Tables 3). The most predominant cause of death was fetal deaths (35.29%) followed by pneumonia (29.41%) meconium

aspiration (11.77%) congenital anomalies (8.82%) and amniotic fluid aspiration (8.82 %) (Table 4).

**Table 4: Showing distribution of cases as per cause of death in infants.**

Sr. No.	Cause of death	Male (%)	Female (%)	Total	Percentage
1	Fetal death	4 (11.76)	8 (23.52)	12	35.29
2	Pneumonia	6 (17.64)	4 (11.76)	10	29.41
3	Meconium aspirations	1 (2.94)	3 (8.82)	4	11.77
4	Congenital anomalies	1 (2.94)	2 (5.88)	3	8.82
5	Amniotic fluid aspiration	1 (2.94)	2 (5.88)	3	8.82
6	Strangulation	1 (2.94)	0	1	2.94
7	Intestinal obstruction	1 (2.94)	0	1	2.94
Total		15	19	34	100

#### 4. Discussion:

Reducing the infant mortality rate less than 30 per 1000 live births by the year 2010 was declared as the major goal of "Health for All policy-2000." <sup>9</sup> Each of the major causes of neonatal deaths can be prevented or treated with known, highly effective and widely practicable interventions such as improvements in prenatal care, intrapartum care and postnatal care. Concern has been raised that neonatal death rates in India are not falling at expected pace. Almost half of India's neonatal deaths are caused by birth asphyxia & birth trauma, sepsis, pneumonia and tetanus etc. that can be avoided by prenatal, intrapartum and postnatal care. <sup>10</sup> Environmental and social barriers prevent the access to basic medical facilities and thus contribute to an increasing infant mortality rate. Among all the neonatal death occurring in developing countries, 86% occurs due to infections, premature births, complications during delivery, and perinatal asphyxia and birth injuries. <sup>11</sup>

In the present study, it was observed that the female infant and fetal deaths were more than males. Maximum number of the cases belong to the rural area. The fetal deaths were slightly more than the neonatal and infant death. The most predominant cause of death was fetal deaths followed by pneumonia, meconium aspiration congenital anomalies and amniotic fluid aspiration. The infections and diseases of infants may be treated if diagnosed in early period. Amniotic fluid aspiration and meconium aspiration can be treated properly if diagnosed in early period. The discarded fetus at the roadside, near railway stations and in the garbage

may be due to poverty, born out of illegal relationships, born out of rape and the inability of parents to rear the children. One case was of strangulation with doubt that the child did not belong to him and maybe born out of illegal relations of his wife with someone else. Death at the time of delivery may be due to complications of pregnancy, placental abnormalities, Birth defects, Infection, and umbilical cord defects. The majority of causes of infant death were preventable and treatable. Hence, we can say that, improving the timing and quality of antenatal care is essential for early detection, anticipating high-risk newborns, and timely interventions. Furthermore, early initiation of feeding and better referral linkage to tertiary health facilities could lead to a reduction in neonatal death in this setting.

In the present study, histopathological examination in case of death due to pneumonia was vascular engorgement and intra-alveolar oedema, neutrophilic infiltration, marked cellular exudate of neutrophils, extravasation of erythrocytes, desquamated epithelial cells, fibrin within the alveoli was seen and patchy consolidation areas. These changes were seen on histopathological examination according to stage of pneumonia. In case of aspiration of meconium bronchus and bronchial tree was shows meconium and the histopathological examination shows signs of aspiration pneumonitis and neutrophilic infiltration. In intestinal obstruction cases haemorrhagic areas were observed, neutrophilic infiltration were observed, necrosis and gangrenes were observed on histopathological findings. In fetal deaths, histopathological examination shows microscopic findings of acute respiratory distress syndrome with collapse of lungs.

Also, Rather than pointing at the medical causes, the socioeconomic factors like income, access to health services and immunization programs are important determinants to assess the status of health of children. Many studies emphasize, how socio-economic and demographic factors impact the infant mortality such as, medical care of the mother during the antenatal period, care at birth, preventive and curative care in the postnatal period. Maternal factors, such as, age at marriage, age at first birth, parity and birth intervals, and household and community-level factors such as, drainage, sanitation could significantly reduce infant mortality rates. <sup>12</sup>

India has witnessed a significant improvement in neonatal health after the

introduction of NRHM. Apart from the JSY, the country has launched several new initiatives to improve neonatal care. Notwithstanding this newfound focus on neonatal health, the annual rate of reduction in NMR and ENMR still lags behind IMR and under-five mortality rate. There is an interplay of different demographic, educational, socioeconomic, biological and care-seeking factors, which are responsible for the disparities and the high burden of neonatal mortality. The country has to increase the coverage of key interventions and also improve the quality of care in health facilities on an urgent basis.<sup>13</sup>

## 5. Conclusion

To conclude, the most predominant cause of death in the present study was pneumonia followed by fetal death and the female deaths were more than male deaths. In the rural area there may be a lack of accessibility to health care facilities, lack of access to health leads to late diagnosis and late intervention and delay in treatment causing most of the deaths. The majority of causes of infant death were preventable and treatable. Improving the timing and quality of antenatal care is essential for early detection, anticipating high-risk newborns, and timely interventions. Also, early initiation of feeding and better referral linkage to tertiary health facilities could lead to a reduction in neonatal deaths.

**Ethical Clearance:** IEC approval is taken from the Institutional Ethical committee.

**Contributor ship of Author:** All authors equally contributed.

**Conflict of interest:** None to declare.

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