Original Article

Infant Mortality and its Causes in Three Different Districts of Punjab, Pakistan

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ABSTRACT

Background: Maternal and newborn mortality rates remain unacceptably high, especially where the majority of births occur in home settings or in facilities with inadequate resources.

Objectives: This study was conducted to estimate the Infant Mortality Rate (IMR), reporting percentage and to identify the risk factors for infant mortality in Punjab, Pakistan.

Study Design: Retrospective Study.

Place and Duration of Study: This study was conducted in the Directorate General, Health Services Punjab, Lahore from 01-07-2007 to 30-06-2008.

Materials and Methods: Community-based cross-sectional survey was conducted during July to September 2009. Interviews of female family heads were conducted by the trained researchers.

Results: Deaths of 786 infants were reported in three districts, verbal autopsy of all cases was done to find out the causes of deaths during infancy. World Bank (2010) reported IMR of Pakistan 71/1000 live birth (estimated infant's deaths 9811), which is very high from this study (6/1000 live birth). Major Causes of infant mortality were found malnutrition 194(24.6%), Acute Respiratory Infections (ARI) 188(23.9%), and Diarrheal Diseases 161(20.4%).

Conclusion: Mortality due to said diseases can be reduced by improving childbearing and childrearing practices, equitable distribution of good standard health care facilities, safe drinking water and individual attention.

Key words: Infant mortality, social conditions, socioeconomic factors, Punjab.

INTRODUCTION

More than half a million maternal deaths, over 3 million stillbirths and 3 million early neonatal deaths occur each year worldwide, the majority in South Asia and sub-Saharan Africa[1-4]. Delivery complications (pro-longed labor, preeclampsia, maternal infection and obstetric hemorrhage) are responsible for half of all maternal deaths, one-third of stillbirths and one-quarter of neonatal deaths[5-9]. Despite established interventions, the majority of maternal and neonatal deaths occur due to a lack of access to life-saving services[10, 11]. The introduction of child survival interventions, immunization and oral rehydration, has resulted in a sustained decline of infant and child mortality in some areas of the developing world but consequently of this decline is that an increasing proportion of infant deaths occur during the neonatal period[12]. However, there is limited epidemiological information on levels and clinical causes of neonatal and post neonatal death, infant mortality is sum of neonatal mortality and post neonatal mortality. Neonatal deaths are generally associated with elements linked to maternal care during pregnancy and delivery, while socio-environmental factors become more important determinants of infant survival during the post-neonatal period. It is estimated that neonatal deaths can account for nearly 50–60% of all infant deaths in developing countries[12]. Approximately 30–40% of all neonatal deaths are explained by neonatal infections, amounting to approximately 1.5–2 million neonatal deaths per year[13]. WHO has estimated that approximately 400 000 cases of neonatal tetanus occur annually, the vast majority in a limited number of developing countries, resulting in an annual toll of 340 000 neonatal tetanus deaths[14], estimated 130 million infants born each year worldwide[15], 4 million die in the first 28 days of life. Three-quarters of neonatal deaths occur in the first week, and more than one-quarter occur in the first 24 hours[15,16]. Two-thirds of the world's neonatal deaths occur in just 10 countries, mostly in Asia. Pakistan is number three among these countries, with an estimated 298 000 neonatal deaths annually and a reported neonatal mortality rate of 49 per 1000 live births, Pakistan accounts for 7% of global neonatal deaths[15-19]. Infection (36%), preterm birth (28%) and birth asphyxia (23%) account for 87% of neonatal deaths worldwide[15, 16, and 20]. Since causes of neonatal deaths vary by country and with the availability and quality of health care, understanding neonatal mortality in

relation to these factors is crucial[16]. Given the paucity of reliable population-based information in Pakistan, this study was undertaken to examine the prevalence, sex distribution, timing and causes of neonatal death in a population-based pregnancy cohort in urban Pakistan. We hypothesized that the neonatal mortality rate in urban population, with relatively good access to obstetric care and timely Caesarean section, would be substantially lower than that generally reported for Pakistan. This study examines delivery outcomes in pregnant women with reasonably good access to professional health care that were enrolled at 20 to 26 weeks' gestation and followed with their infants to 28 days postpartum[21].

MATERIALS AND METHODS

This study was conducted from 01-07-2007 to 30-06-2008. The inclusion criteria were neonates died within one year of their birth. The record was collected from the hospitals, chowkidars, lumberdar, district national programme units and secretary union councils. Information obtained was the deceased age, antenatal care, level of cure, wealth, child-rearing (weaning) & childbearing practices (spacing), health care facilities, immunization, safe drinking water .The source of information were mothers or direct relatives of the deceased.

Comparing three districts (Sialkot, Chakwal and D.G.Khan) of Punjab, all have different economic situations. Sialkot is rich, Chakwal is in the middle range and D.G. Khan is an economically poor district of the Punjab. This study was planned to assess the infant mortality rates and its causes in correlation with economic indicators. Positive association between high infant mortality and income inequality is still present after controlling for other factors such as education, medical personnel, and fertility. The positive association of infant mortality and the income of the rich suggest that measured real incomes may be a poor measure of social welfare.

This study also examined factors associated with infant survival in Pakistan. Data of National Programme for family planning and primary health care of the districts was collected. Survey was conducted by the trained staff of the project funded by the United Nation Family Planning Association (UNFPA).

The infant mortality rate was still very high in Pakistan until the early 1990s, at 100 deaths per 1000 live births. Large differentials in infant survival by socio-economic factors and access to water and sanitation indicate that social and gender inequities are the underlying cause of the stagnation of infant mortality in Pakistan. Economic and social policies of earlier decades have resulted in tremendous disparities in wealth and access to resources in Pakistan. The low social, economic and legal status of women is intimately tied to the well-being of their children. Health interventions in Pakistan should be designed to reach the most under-served: women and children. Systematic evaluations of health interventions will be necessary to make informed decisions about health investments in the future.

This paper generated and analyzed the survey data on inequalities in mortality among infants aged less than one year in Punjab, Pakistan. Mortality rates were estimated directly where complete fertility histories were available and indirectly otherwise. Mortality distributions were compared between districts, gender and different age groups by means of percentage.

RESULTS

786 infants of the age 0 hour to 11 months and 29 days found died during study period from 01-07-2007 to 30-06-2008. One of the objective of the study was to see the reporting percentage, which was found only 8% overall, which is significantly poor reporting. In different districts reporting ranges between 4-13% (Table No.1).

Table No.1: District wise infant mortality rate in Punjab, Pakistan

	Sialkot	D.G. Khan	Chakwal	Total
Population	2734481	1643118	1083725	5461324
Birth rate (world Bank)	25.3	25.3	25.3	25.3
Live births	69182	41571	27418	138171
Infants estimated deaths if IMR is 71 (World Bank)	4912	2951	1947	9811
Infants reported deaths	414	116	256	786
%age reporting	8	4	13	8

Out of 786 deceased only 432(55%) were reported by district national programme for family planning and primary health care, research teams traced 354(45%) more cases (Table No.2). Highest number 414 cases were found from Sialkot. From Chakwal 256 and from D.G.Khan 116 cases were recorded.

Table No.-2: Infant's Deaths reported by research team and National Programme (NP) of family planning and primary health care

Reported by	Sialkot (%age)	D.G.Khan (%age)	Chakwal (%age)	Total (%age)
Research team	187 (45)	42 (36)	151 (59)	354 (45)
National programme	227 (55)	74 (64)	105 (41)	432 (55)
Total	414 (53)	116 (15)	256 (32)	786

Female infants 550(69.97%) died more as compared to males 236(30.03%), same trends were found in all districts. Highest number infants 409(52.2%) died in the age of 1-10 days (Table No.3).

In D.G.Khan undiagnosed deaths recorded were found highest 30(25.9%), in Chakwal ARI was recorded highest 69(27.0%) and in Sialkot highest deaths were noted by malnourishment 113(27.3%). Highest causes of deaths were found malnourishment 194(24.6%) and ARI 161(20.4%) as shown in Table No.4.

Table No.3: Gender and Age wise infant mortality in Punjab, Pakistan

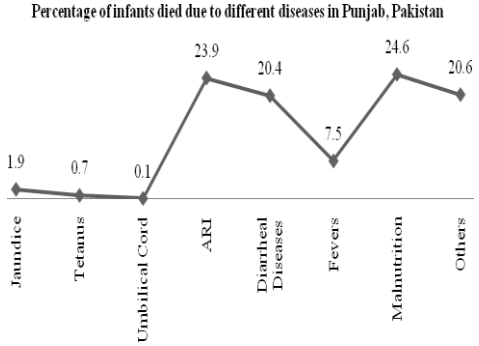
Pakistan; Birth Rate 2010-25.3/1000 population, IMR 2010-71(World bank), 65.3(Pakistan website)				
	Sialkot (%age)	D.G.Khan (%age)	Chakwal (%age)	Total (%age)
Population	2734481	1643118	1083725	5461324
Study subjects	414	116	256	786
IMR	6	3	9	6
Gender				
Male	82(19.81)	55(47.41)	99(38.67)	236(30.03)
Female	332(80.19)	61(52.59)	157(61.33)	550(69.97)
Age				
<1day	86(20.67)	12(10.34)	45(17.58)	137 (17.4)
1-10 days	257(61.78)	73(62.93)	114(44.53)	409(52.2)
11-29 days	3 (0.72)	14(12.07)	18(7.03)	44(5.6)
1-2 months	39(9.38)	12(10.34)	30(11.72)	93 (11.8)
3-5 months	20(4.81)	1(0.86)	31(12.11)	65(8.3)
6-9 months	10 (2.40)	4(3.45)	14 (5.47)	30(3.8)
10-11 months	1(0.24)	0(0.00)	4(1.56)	8(0.9)

Table No.4: Area wise causes of infant mortality in Punjab, Pakistan

Clinical cause	Sialkot # (%age)	D.G.Khan # (%age)	Chakwal # (%age)	Total # (%age)
Jaundice	4(1.0)	3(2.6)	8(3.1)	15(1.9)
Tetanus	4(0)	1(0)	1(0)	6(0.7)
Umbilical Cord	0(0)	0(0)	1(0)	1(0.1)
ARI	96(23.2)	23 (19.8)	69(27.0)	188(23.9)
Diarrheal Diseases	95(22.9)	17(14.7)	49(19.1)	161(20.4)
Fevers	15(3.6)	17(14.7)	27(10.5)	59(7.5)
Malnutrition	113(27.3)	25(21.6)	56(21.9)	194(24.6)
Others	87(21.0)	30(25.9)	45(17.6)	162(20.6)
Total # (%age)	414(52.67)	116 (14.76)	256(32.57)	786

In total study area highest cause of infant mortality is shown in Figure-1, which is malnutrition (24.6%).

Figure No.1- Diseases wise infant mortality in Punjab, Pakistan



DISCUSSION

The death of infants is also tragedy, like death of mothers during delivery. It is a huge burden of grief and pain. Infant mortality in Pakistan is high at about 125-140/1000, for a country with mid-level per capital income[22]. Maternal education is a strong indicator of survival, much more so than paternal education. Similarly, female heads of households increased survival, probably because they control financial allocations. The study suggested that rather solely concentrating to eliminate poverty overall, improvements in maternal education, nutrition, health care facilities and ease of access to their use could be more helpful. Childbearing and child-rearing methods would do more to improve child survival in Pakistan. Present study results also agree with the author suggestions[22], about the maternal education, nutrition,

health care facilities and their use, and childbearing and child-rearing methods would be more important interventions to decrease the IMR in Pakistan.

Between 1985 and 1987, a community-based case-management programme for acute lower respiratory infection (ALRI) was conducted in a rural district of Abbotabad, in northern Pakistan. The impact on infant and child mortality of this programme, which included active case-finding and maternal health education, was evaluated and found that the total child mortality rate in the control villages declined by 29% to 27.8 per 1000 children per year (P = 0.09). Similar intervention-associated declines in the infant mortality rate were also observed[23]. Present study also suggested that ARI is high cause of mortality but with good intervention can be reduced.

It is concluded that existing health services must be improved and emergency obstetric care should be available to all women and children round the clock. Provision of antenatal care should be uniform and optimal. Nutritional status of infants should be improved to discourage rise in infant mortality. Referral system should be properly organised so that delay in seeking help could be avoided. Socio-economic status of community needs to be improved to avoid hindrance of high cost of care and poverty. Health care should be free for all infants. Non-governmental organizations should expand their services in rural areas to upgrade infant health status. It is global issue but more prevalent in developing countries. By strengthening of safe motherhood including antenatal care, clean safe delivery and essential obstetrical care, careful use of drugs to control ARI and breast feeding with appropriate died can decrease the infant mortality in Pakistan. Mothers' training on home management of ARI, DD and malnourishment can play a significant role to reduce IMR in Pakistan.

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