ORIGINAL PROF-1963

NEONATAL RESUSCITATION

Impact of Neonatal Resuscitation Programmes on Birth Asphyxia, The Actual Situation

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ABSTRACT… Each Year Billions of dollars have been spent on the various programmes for Maternal and child health services in collaboration with international organizations and hundreds of doctors and thousands of skilled (SBAs) birth attendants and lady health workers have been trained. **Objective:** To evaluate the impact of neonatal resuscitation programs on the prevalence of birth asphyxia in a hospital which drains a large population of Punjab. **Study design:** Cross sectional. **Duration & Place of study:** Department of Paediatric Medicine, Nishtar Medical College & Hospital, Multan from January 2008-December 2008. **Methods:** All newborns with a H/o failure to initiate or sustain respiration at birth or H/o associated convulsions who were admitted (referred or hospital based) with the diagnosis of Birth Asphyxia and a weight > 1.5 kg were included, still born and those with lethal congenital malformations were excluded. A questionnaire was designed after extensive review of literature and data recorded. The data of past 10 years for Birth Asphyxia was also collected from the hospital record and compared with the present results. **Result:** In year 1998 a total of 722 Newborns were admitted in our neonatal unit out of which 210 (29.0%) were diagnosed as Asphyxia Neonatorum. This number has progressively increased over the past 10 years with a total of 846 out of total 2079 newborns (40.78%) admitted in 2008 with a diagnosis of asphyxia. Out of the total 846 patients, there were 69% Male and 31% Female with a M:F ratio of 2.2:1. 46% were delivered by SVD (17.39% in Nishtar Hospital 15.21% by dais, 32.6% by Private doctors and 34.78% by LHV) and 54% were delivered by caesarian section, out of which 46.29% were delivered in Private hospitals and 54% in Nishtar Hospital. Overall 65% deliveries were in the private sector or at home and 35% in the Government hospitals 60% babies had come from Multan and 40% from other town or cities. A H/o one or more antenatal visits was present in 68% of mothers. Out of total cases of B.A. 26% were in B.A Grade-I 59% in Birth Asphyxia Grade-II 15% in B.A Grade-III. Out of this total 45% expired. **Discussion & Conclusion:** As we are moving towards the 4th MDG and Pakistan strives to improve its health indicators and we claim to decrease the infant mortality, neonatal and perinatal mortality rate. The incidence of birth asphyxia rises with increased burden of morbidity. Even though the principles of NRPs are recommended for international application, this program widely used in the developed world has not been properly disseminated in communities in the developing countries, especially Pakistan.

Key words: Birth Asphyxia (B.A), Neonatal Resuscitation Programs (NRPs).

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INTRODUCTION

Each year 4 million babies die in 1st 28 days of life, 3 million of these deaths occur within one week of birth and at least 1 million babies die on their 1st day of life[2]. These 3 million still births and 500,000 maternal deaths occur close to birth more then 50% of newborns who die are born at home[1].

The under 5 mortality was halved between 1960-1990, greater reduction was for the children after the 1st month of life with little decrease in the neonatal period.

Neonatal deaths account for 38% of the world's death of children less than 5 years. The 4th Millennium Development Goal (MDG) aspires to a global target by 2015 of reducing the under 5 mobility by 2/3rd. Currently there the estimated mortality is 30/1000 live births in the neonatal period[2].

Most deaths during the neonatal period occur at home and are often unregistered[3]. The WHO estimated that three conditions B.A, prematurity and other perinatal causes contribute to 6.3% of global disability[4].

Only 1% deaths occur in high income countries which have an average NMR of 4/1000 live births whereas Low income countries have an average NMR of

33/1000 live births with a range of 2-70[7].

The disparity in Neonatal Mortality Rate between low and high income countries is increasing over time especially during the early neonatal period. There is almost 60% reduction in high income countries between 1983 and 2000 and only 15% reduction in low income countries. In South Asia and Sub Saharan Africa the decline in late neonatal deaths was influenced by halving of neonatal tetanus that occurred in 1990's. In low income countries 3 causes of neonatal deaths, infections (Pneumonia, diarrhoea and tetanus) 36%, prematurity 28% and asphyxia 23% account for majority of neonatal deaths[7].

About 5-10% of NB, do not breathe spontaneously and require stimulation and about half of those having difficulty initiating breathing require resuscitation[5].

For most babies a self inflating bag and mask is life saving and most NB's can be successfully resuscitated without the use of oxygen[6].

53% women worldwide deliver with a skilled birth attendant < 30% in the poorest countries and >98% in rich countries[7]. In Pakistan skilled birth attendants attend to only 24% of births even though 15% of births have life threatening complications[25].

Suboptimal hospital management of women in labor or NB's contribute to 10-75% of all perinatal deaths[6].

A large industry is developing high tech devices for NB care, to address the 2% of neonatal deaths in rich countries, yet there is little investment in the development and testing of low cost simple robust devices in settings where most fetal and neonatal deaths occur[8].

Pakistan is a signatory to the MDG4 with target of reducing maternal and infant mortality by 66-75% by year 2015[13,14,15]. Various programmes initiated for maternal and neonatal health have been a part of policies since decades in Government Sector. Table-I. Billions of dollars have been spend on the various programmes for Maternal and child health services in collaboration with international organizations and hundreds of doctors and thousands of skilled birth attendants (SBAs) and lady health workers have been trained.

Pakistan's health infrastructure is very strong but there is no functional referral system between Primary level, mid level and secondary health facilities[26].

MATERIAL & METHODS

Objective

To evaluate the impact of neonatal resuscitation programs on the prevalence of birth asphyxia in a hospital which drains a large population of Punjab, Interior Sindh, Balochistan and adjacent area of Khyber Pakhtoon Khwah.

Study design

Descriptive.

Duration & Place of study

Department of Paediatric Medicine Nishtar Medical College & Hospital, Multan. From January 2008-December 2008.

Inclusion criteria

All newborns with H/o failure to initiate or sustain respiration at birth or Associated convulsions in first 24 hours & weight > 1.5 kg.

Exclusion criteria

Still born
Lethal congenital malformations
A questionnaire was designed after review of literature, and data recorded.

The data of past 10 years for Birth Asphyxia was also collected from the hospital record and compared with

the present results.

Statistical Analysis

Data was entered and analyze through SPSS version 10 and frequency and percentages were calculated. For the categorical variables, descriptive statistics were applied to calculate mean and standard deviation.

RESULTS

In year 1998 a total of 722 newborns were admitted in our neonatal unit out of which 210 (29%) were diagnosed as asphyxia neonatorum this number has progressively increased over past 10 years with (848) 40.78% of total (2079) admissions being diagnosed as birth asphyxia in 2008. Table-II Figure 1.

There were 69% males and 31% females with a M:F of 2.2:1. Table-III.

46% of deliveries were by SVD and 54% by caesarian section. Out of the SVDs 17.39% were delivered in Nishtar Hospital and 15.21% by local unskilled birth attendant, 32.6% by skilled birth attendant and 34.78% by private doctors. Out of the caesarian sections 46.29% were delivered in private sector and 54% in Nishtar Hospital, Multan. Overall 65% deliveries were in Private sector or at home and 35% in the

Accelerated health programme	1985	for training TBA's & DAI's	N.A
National Programme for family & health care MNCH programme	1994	training of LHVs & by 2006, 93000 LHVs trained to cover 60-70% rural population	$ 320 million
Health sector reform proramme	2006	To strengthen primary and secondary health care	Rs. 2.8 billion for FY 2009
Chief Minister's initiative for primary health	2003	-	Rs. 500 million initially
Punjab integrated primary health care model prog. Supported by national commission for human development	2007	-	Rs. 3.37 billion
Programmes with multilateral / bilateral donors			
United States agencies for international USAID. The Pakistan initiative for mothers and newborns project. PAIMAN	2007-2012	$ 50 million	
Safe motherhood initiative UNICEF	-	N.A	
World health organization WHO country cooperation programme	2005-2009	N.A	
Canadian international development agency	-	$ 7 million	
Save the children (USA) saving the newborn lives initiative	2001	N.A	
FALAH (advancement for life and health project)	-	N.A	
Japan international cooperation agency (JICA).	-	N.A	

Table-I. Maternal & child health programmes sponsored by Government

Government facilities. Table IV.

Out of the total newborns admitted during January to December 2008 26% had B.A Grade-I, 59% B.A Grade-II and 15% B.A Grade-III. Out of this total 45% expired, 90% of birth asphyxia Grade-III and 40% B.A Grade-II.

60% newborns had come from Multan city and 40% from the other places. History of antenatal visit 1 or more was positive in 68% and 32% mothers did not have antenatal visit.

Year	Total N.B	B.A	%
1998	722	210	29.0
1999	767	265	34.55
2000	924	249	26.94
2001	1105	351	31.76
2002	1213	373	30.75
2003	1207	395	32.725
2004	1342	489	36.438
2005	1419	572	40.31
2006	1616	685	42.38
2007	1608	723	44.96
2008	2079	848	40.78

Table-II. Number of birth asphyxia patients on yearly basis

DISCUSSION

Birth Asphyxia is the 5th largest cause of under 5 children deaths (8.5%), after pneumonia, diarrhoea and neonatal infections and prematurity. It accounts for 0.92 million neonatal deaths annually and is associated with another 1.1 million intrapartum still births as well as unknown burden of long term neurological disability and impairment[9,10].

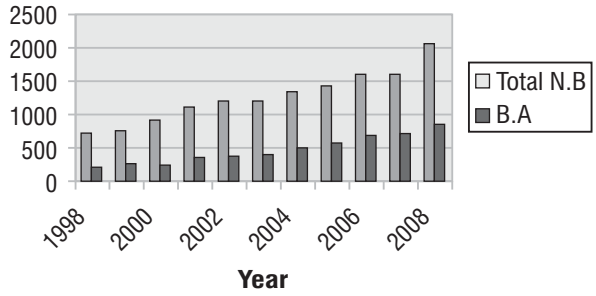

Fig-1. Number of birth asphyxia patients on yearly basis

Mode of delivery	Referral	Number (n)	%
SVD 46% (N=390)	NHM	68	17.39%
	Dai	59	15.21%
	LHV	136	34.78%
	Private Doctor	127	32.60%
Caesarian 54% (n=458)	NHM	247	54%
	Private Clinics	211	46.0%

Table-III.

Age at admission (hrs)	Male (%)	Female (%)	Total (%)
0-1	17	19	36
1-4	27	06	33
4-12	06	05	11
12-24	04	02	06
24-48	12	02	14
Total	66	34	100

Table-IV. Aᵭe & ᵭender distribution at admission 2008

If 10 million child deaths are combined with 3.2 million still births then birth Asphyxia and intrapartum still births constitute the No. one cause of child and late fetal deaths and yet B.A is largely invisible in health policy and receives limited programmatic or research

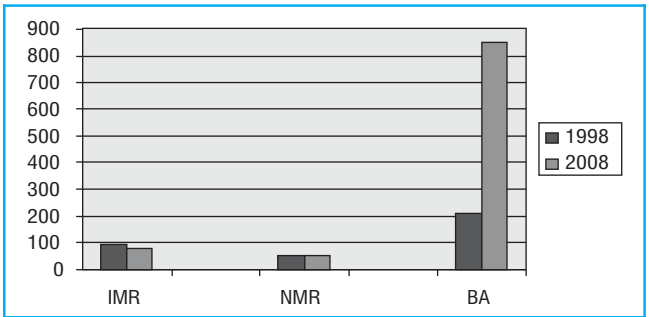

Fig-2. Comparison of health indicators with birth asphyxia

funding[11,12].

Evidence exists regarding the effectiveness of intervention to reduce deaths due to neonatal infections and improve survival of small babies, but prevention and management of B.A are much more complex at the community level. Skilled birth Attendants attend to 25% of births in Pakistan even though 15% of births have life threatening complications[25,26].

Amongst the reported programmes at various levels, provision of neonatal care and referral of Asphyxiated babies were elements of fewer than 10% of programmes[12].

Pakistan has a population of 160 million and 0.3 million newborns die each year with a neonatal mortality rate of 57/1000 and perinatal mortality rate is 59/1000 ranging from 54/1000 (Karachi) to 82/1000 (Faisalabad). Ref. 14 Figure-2

Pakistan is a signatory to the MDG4 with target of reducing maternal and infant mortality by 66-75% by year 2015[13,14,15]. Various programmes initiated for maternal and neonatal health have been a part of policies since decades in Government Sector. Table-I

Pakistan's health infrastructure is very strong bur there is no functional referral system between Primary level, mid level and secondary health facilities[26]. Private sector caters to 75% of the population[16].

In our study 65% deliveries were by private sector or at home. The high rate of birth asphyxia are compounded by the fact that deliveries are generally conducted at home and 60% of newborns with birth asphyxia report well, after the 1st 24 hours of birth. In our study 21% babies were brought to the hospital after 24 hrs. of age. Report from a teaching hospital Pediatric ward in Sindh indicates that out of the newborns admitted with birth asphyxia many of those delivered within the hospital, more than 60% were only referred to neonatal unit well beyond 24 hrs. after birth frequently with adverse outcomes[23].

More disturbingly review of data on perinatal mortality rate from JPMC Karachi indicates that there has been no change in the perinatal mortality rate in the inborn population over last 25 years, 92/1000 live births in 1965-1966 and 109/1000 live birth in 1990-91[17-18].

Pakistan demographic and health survey (PDHS) 2007 estimated that 62% of all neonatal deaths took place in the first week after birth[19].

A study in Lahore Pakistan indicates almost 50% of all first week deaths were due to B.A[20].

In a review of over 10,000 consecutive live births, Arif et al noted a 4% prevalence of B.A with a case fatality rate of 65%[21]. A review of early neonatal deaths over a 25 years period in the same facility indicated that the proportion of deaths due to B.A has increased from 25% to 38%[22]. In our study mortality rate was 0% in B.A grade-I, 49% in grade-II and 100% in grade-III Birth asphyxia.

It is unclear from available information as to exactly what proportion of newborns with birth asphyxia suffer from residual handicap. There are potentially 80/1000 death in neonatal period due to B.A per year in Pakistan and at least 2-3 times this number may be left

with residual handicap[24].

CONCLUSIONS

As Pakistan strives to improve its health indicators for the 4th MDG. The incidence of birth asphyxia rises with increased burden of morbidity. We can conclude that Neonatal Resuscitation Programs have not been properly disseminated in communities in the developing countries, especially Pakistan, despite billions of dollars being spent on NRP's. While reaching the child mortality bench marks in imperative, just surviving is not enough.

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A doctor can bury his mistakes but an architect can only advise his clients to plant vines.

Frank Lloyd Wright (1868-1959)