Frequency of Causes of Mortality among Neonatal Age Group In Pediatrics Unit of Civil Hospital, Karachi

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ABSTRACT:

Objective: Frequency of Causes of Mortality among Neonatal Age Group In Pediatrics Unit of Civil Hospital, Karachi.

Participants and Method: It was a statistical study, conducted at Pediatric Unit of Civil Hospital, Karachi. In this study all data was collected by the co-investigators during a period of 1st January 2014 to 31st December 2014,867 neonates were selected as these number of infants presented in the year 2014 in civil hospital, Karachi, and in the end data was analyzed by using SPSS 20.0 version.

Results: Out of 867 neonates, 475(54.8%) were baby boys and 392(45.2%) were baby girls. The highest prevailing condition, being reason for admissions in both genders, was low birth weight, found in 116 boys and 96 girls. Out of 867 neonates admitted, 282 neonates suffered mortality with mortality percentage being 32.52%. Low birth weight (<2.5kg) caused largest number of mortalities (72 neonates), keeping in view their highest prevalence. The highest mortality ratio was found in preterm plus low birth weight (<1.5kg) neonates causing mortality in 46 out of 77 neonates admitted with this condition (59.74%) revealing the severity and lack of management of this condition.

Conclusion: low birth weight appears to be the commonest cause of mortality among neonates in our locality. low birth weight not appears to be a great issue in first world countries like U.S.A, China and entire Europe but it appears to be a great threat to the lives of our neonates which can be prevented by improving the nutrition status of the pregnant females during their pregnancy, as by improving this we can save the lives of our neonates which are a precious part of one's family.

MesH words: neonates, mortality, karachi, frequency.

INTRODUCTION:

The neonatal period – the first 28 days of the life – is the most speculative time for the child's survival.

Of the predicted 130 million infants born each year worldwide,[i] around 4 million dies in the first 28 days of life. Of these, three-quarters of the neonatal death occur in first week and more than one-quarter in the first 24 hours of life.[ii]

Neonatal mortality is defined as the number of neonates dying before reaching 28 days of age. It is further divided into two, Early neonatal mortality refers to a death of a live-born baby within the first seven days of late life and Late neonatal mortality covers the time after 7 days until before 28 days. Neonatal mortality rate is defined as neonatal deaths per 1000 live births.

Two-third of world's neonatal mortality occurs in only 10 countries and that mostly in Asia. Pakistan ranks three among these countries and accounts for 7% of global neonatal deaths.[iii]

There are number of causes of neonatal mortality, some of which are reversible and can be prevented. Biological, socio-economic and health care factors all are associated with neonatal mortality.[iv] Poor neonatal care and unhealthy home care methods, such as wasting colostrum, application of unclean substances to umbilical-cord stump and failure to keep the baby warm all have a negative impact on the health of a newborn baby.[v]

There is an excessive risk of neonatal mortality in male infants as compared to female and so in non-whites and poorsas compared to Caucasians and non-poor.[vi]

Diarrhea is the major cause of pediatric death worldwide,[vii] however neonate has an increased susceptibility to complications related to diarrhea due to the immaturity of their systems.[viii] Deaths due to diarrhea during the neonatal period have been estimated to be 1% of all deaths among children 0–59 months of age .[ix]

Breastfeeding is crucial for a child's survival. It has been estimated that 16% of the neonatal deaths can be prevented if breastfeeding is started from day 1 and the number rises to 22% if it is started within first hour of life,[x] therefore early and exclusive breastfeeding should be accentuated. It help prevent hypothermia, hypoglycemia and infections for example sepsis, diarrhea, acute respiratory tract infection, meningitis e.t.c in a newborn baby.[xi]

Pneumonia is an important cause of neonatal infections and contributes to significant neonatal morbidity and mortality. Throughout the childhood, neonatal period has the greatest risk of death from pneumonia.[xii] Furthermore, Ventilator associated pneumonia causes more increase rate of death in preterm babies.[xiii]

Infections cause about 1.6 million neonatal deaths per year in developing countries and of these sepsis and meningitis are on the top of the list.[xiv]In the United States, bacterial sepsis affects upto 32000 live births annually.[xv]

Preterm birth (defined as delivery before 37 weeks of gestation) and low birth weight (defined as birth weight less than 2500g) are strongly responsible for neonatal deaths either directly or indirectly.[xvi] Babies who weigh less than 1500g have 100 fold higher risk of mortality than baby with optimum weight.[xvii] As reported in WHO 30% of neonatal deaths are due to preterm deliveries globally.[xviii]Late preterm birth are associated with significant morbidity and mortality when compared with birth at 39 weeks.[xix]Preventing preterm labour would significantly affect neonatal outcome.[xx]

Birth asphyxia (defined as failure to initiate and sustain breathing at birth) contributes 30% to neonatal mortality.[xxi]Of these asphyxiated neonates, growth retardation, hypothermia, hyaline membrane disease and seizures adds increased risk to death,[xxii] but luckily birth asphyxia can easily be prevented .

Fetal malnutrition is a significant risk factor for a neonatal outcome.[xxiii]Malnutrition and infections are synergistically related to each other.[xxiv]Maternal malnutrition also contributes to adverse neonatal outcome.[xxv]Intake of good food during pregnancy has been considered important both for the health of mother and fetus.[xxvi]

Congenital anamolies has an important impact on neonatal mortality. The occurrence of congenital abnormalities ranges from 1% - 4% depending on the place and population studied.[xxvii],[xxviii].Congenital abnormalities involving cardiovascular system accounts for 33% of the neonatal deaths and those involving pulmonary systems accounts for 27% of the neonatal deaths.[xxix]

Malaria has been known as an important cause of infant mortality and morbidity but is rare in neonatal age group.[xxx]However in malaria endemic area for example sub-saharan Africa, congenital malaria was seen in around 7% of the neonates[xxxi] Neonatal malaria increases the risk of neonatal death[xxxii].Malaria adds a burden to perinatal disease in regards to pregnancy losses, prematurity and intrauterine growth retardation.[xxxiii],[xxxiv],[xxxv]

Number of patients and the level of care provided in NICU in a hospital to a newborn both has a significant impact on neonatal outcome.[xxxvi]

METHOD AND METHODOLOGY:-

The study was carried out at Pediatric units of Civil Hospital Karachi; one of the most important and top notched facility providing enhanced health care to patients visiting the establishment. It is a questionnaire based statistical study conducted during the period of January 2014 till December 2014

In the beginning the topic was decided and a Performa was outlined by our supervisor's help and joint collaboration of all the co-investigators. After all ifs and buts plus healthy arguments we finalized the Performa, which was divided into two components, first component includes bio data containing name (as optional), age, location and ethnic-group of the subjects of the study. Second component includes causes of neonate mortality:-Birth asphyxia, Sepsis, preterm, low birth weight, meningitis, neonatal jaundice, tetanus, respiratory distress syndrome, pneumonia, congenital heart disease. This study is ethically and duly approved by Institute of Research Board (I.R.B) Subjects for this statistical study are selected on basis of the fact that we have collected sample from all the neonates presenting in emergency, nursery or pediatric ward of Civil Hospital, Karachi. Sample size for this study equals the number of demises amongst neonates in the year 2014 in this department.

Only those neonates who expired during their period of admission in Pediatric Units of Civil Hospital, Karachi were exclusively included in our study we also collected the total number of neonates presenting in the year of 2014 in order to find out the percentage of deaths among neonates. Those who died during admission to other units of CHK and other hospitals were duly excluded. Performa of the respective study were to be filled by all the members of this study .After entire filling of the Performa, data is entered and statistically analyzed by using SPSS 20.0 version software and results were extracted through it as per given below in results.

RESULTS:

A total of 867 neonates were admitted in pediatric units of CHK in the year 2014 out of which 475 were baby boys and 392 were baby girls. The highest prevailing condition, being reason for admissions in both genders, was low birth weight, found in 116 boys and 96 girls.

Out of 867 neonates admitted, 282 neonates suffered mortality with mortality percentage being 32.52%. Low birth weight (<2.5kg) caused largest number of mortalities (72 neonates), keeping in view their highest prevalence. The highest mortality ratio was found in preterm plus low birth weight (<1.5kg) neonates causing mortality in 46 out of 77 neonates admitted with this condition (59.74%) revealing the severity and lack of management of this condition**(TABLE)**

DISCUSSION:

Our study showed multiple factors affecting neonatal mortality rate in our area which needs to be looked upon if neonatal survival has to be improved. The most important cause of neonatal death in our area is LBW present in 41.8% cases whereas birth asphyxia and septicemia are the commonest cause of neonatal death in the Kolkata study.[xxxvii]

In the ICMR study, infections (32.8%) followed by birth asphyxia (22.3%) and prematurity (16.8%) were the leading causes of neonatal death.[xxxviii]

In a study carried out in rural sub-district of Bangladesh , LBW contributed to 15.1% of neonatal death which is much lower figure as compared to our study suggests better neonatal care and better management of LBW neonates.[xxxix]

Preterm birth contributed to 52% of neonatal death as suggested by the analysis of data in East Africa while in our study it contributed to 25.88% of neonatal death which shows less neonatal care and undernutrition status in East Africa.[xl]

Preterm birth was also second most important cause of neonatal death in Spain as suggested by a study carried out by Alonso and his fellows.[xli]

Verbal autopsy implicated birth asphyxia in 34% of the cases in a study showing neonatal mortality of LBW infants in Bangladesh[xlii]. While asphyxia is responsible for 9.22% of neonatal death in our study.

Singh in his study observed that 12% of neonatal deaths were due to infections and in particular due to bacterial sepsis which is almost a similar figure as found in our study. This cautions health care system to give particular attention to prevention and management of sepsis.[xliii]

Umesh and his fellows in their research observed respiratory syndrome to be responsible for 15% of neonatal deaths which is approximately comparable to our study in which 14% suffered from the same condition.[xliv]

CONCLUSION:-

low birth weight appears to be the commonest cause of mortality among neonates in our locality. low birth weight not appears to be a great issue in first world countries like U.S.A, China and entire Europe but it appears to be a great threat to the lives of our neonates which can be prevented by improving the nutrition status of the pregnant females during their pregnancy, as by improving this we can save the lives of our neonates which are a precious part of one's family.

REFERENCES:-

[i]World health report 2005: Make every mother and child count. Geneva: WHO; 2005.
[ii]Lawn JE, Cousens S, Zupan J. 4 million neonatal deaths: When? Where? Why? Lancet 2005; 365: 891-900 doi: 10.1016/S0140-6736(05)71048-5 pmid: 15752534.
[iii]ImtiazJehan , Hillary Harris , Soha.il Salat , Amna Zeb , NaushabaMobeen , Omrana Pasha , Elizabeth M McClure , Janet Moore , Linda L Wright & Robert L Goldenberg . Neonatal mortality, risk factors and causes: a prospective population-based cohort study in urban Pakistan. Bulletin of the World Health Organization 2009;87:130-138. doi: 10.2471/BLT.08.050963
[iv]Lukonga ,Michelo . Factors associated with neonatal mortality in the general population: evidence from the 2007 Zambia Demographic and Health Survey (ZDHS); a cross sectional study. Pan Afr Med J. 2015
[v]Zupan, Jelka. "Perinatal mortality in developing countries." New England Journal of Medicine 352.20 (2005): 2047-2048.
[vi]Naeye, Richard L., et al. "Neonatal mortality, the male disadvantage." Pediatrics 48.6 (1971): 902-906.
[vii]Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS. How many child deaths can we prevent this year? Lancet. 2003;362:65–71.
[viii]Fanaroff AA, Stoll BJ, Wright LL, Carlo WA, Ehrenkranz RA, Stark AR, Bauer CR, Donovan EF, Korones SB, Laptook AR, et al. Trends in neonatal morbidity and mortality for very low birthweight infants. Am J Obstet Gynecol. 2007;196:147.e1–147.e8
[ix]Black RE, Cousens S, Johnson HL, Lawn JE, Rudan I, et al. (2010) Global, regional, and national causes of child mortality in 2008: a systematic analysis. Lancet 375: 1969–1987.
[x]Edmond, Karen M., et al. "Delayed breastfeeding initiation increases risk of neonatal mortality." Pediatrics 117.3 (2006): e380-e386.
[xi]Huffman, Sandra L., Elizabeth R. Zehner, and Cesar Victora. "Can improvements in breast-feeding practices reduce neonatal mortality in developing countries?." Midwifery 17.2 (2001): 80-92.
[xii]T Duke, Neonatal pneumonia in developing countries, Arch Dis Child Fetal Neonatal Ed 2005;90:F211-FF219 doi:10.1136/adc.2003.048108
[xiii]Apisarnthanarak, Anucha, et al. "Ventilator-associated pneumonia in extremely preterm neonates in a neonatal intensive care unit: characteristics, risk factors, and outcomes." Pediatrics 112.6 (2003): 1283-1289.
[xiv] S Vergnano, M Sharland, P Kazembe, C Mwansambo, P T Heath; Neonatal sepsis: an international perspective; Arch Dis Child Fetal Neonatal Ed 2005;90:F220-FF224 doi:10.1136/adc.2002.022863
[xv]Lukacs, Susan L., Kenneth C. Schoendorf, and Anne Schuchat."Trends in sepsis-related neonatal mortality in the United States, 1985–1998." The Pediatric infectious disease journal 23.7 (2004): 599-603.
[xvi]Simmons LE, Rubens CE, Darmstadt GL, Gravett MG (2010) Preventing preterm birth and neonatal mortality: exploring the epidemiology, causes, and interventions. SeminPerinatol 34: 408–415
[xvii] Olga Basso , Allen J. Wilcox and Clarice R. Weinberg; Birth Weight and Mortality: Causality or Confounding?; Oxford JournalsMedicine & Health American Journal of Epidemiology Volume 164, Issue 4Pp. 303-311.
[xviii]Bryce J, Boschi-Pinto C, Shibuya K, Black RE, WHO Child Health Epidemiology Reference Group WHO estimates of the causes of death in children. Lancet. 2005;365:1147–52.
[xix]McIntire, Donald D., and Kenneth J. Leveno. "Neonatal mortality and morbidity rates in late preterm births compared with births at term." Obstetrics & Gynecology 111.1 (2008): 35-41.
[xx]Rush, R. W., et al. "Contribution of preterm delivery to perinatal mortality." BMJ 2.6042 (1976): 965-968.
[xxi]Anne CC Lee, MD, MPH,a Luke C. Mullany, PhD, James M. Tielsch, PhD, Joanne Katz, ScD,Subarna K. Khatry, MBBS, Steven C. LeClerq, MPH, Ramesh K. Adhikari, MD,Shardaram R. Shrestha, MPH, and Gary L. Darmstadt, MD; Risk Factors for Neonatal Mortality due to Birth Asphyxia in Southern Nepal;Pediatrics. 2008 May; 121(5): e1381–e1390.doi: 10.1542/peds.2007-1966
[xxii]MacDonald, Hugh M., et al. "Neonatal asphyxia. I. Relationship of obstetric and neonatal complications to neonatal mortality in 38,405 consecutive deliveries." The Journal of pediatrics 96.5 (1980): 898-902.
[xxiii]Korkmaz A, Tekşam O, Yurdakök M, Yiğit S, Tekinalp G; Fetal malnutrition and its impacts on neonatal outcome in preterm infants. Turk J Pediatr. 2011 May-Jun;53(3):261-8.

[xxiv]David L. Pelletier; The Potentiating Effects of Malnutrition on Child Mortality: Epidemiologic Evidence and Policy Implications; DOI: http://dx.doi.org/10.1111/j.1753-4887.1994.tb01376.x 409-415 First published online: 1 December 1994
[xxv]Bamji MS, V S Murthy PV, Williams L, Vardhana Rao MV; Maternal nutritional status & practices & perinatal, neonatal mortality in rural Andhra Pradesh, India; Indian J Med Res. 2008 Jan;127(1):44-51.
[xxvi]WEBB, JEAN F. "Maternal Nutrition and Perinatal Mortality." Canadian Journal of Public Health/Revue Canadienne de Sante'ePublique (1956): 482-484.
[xxvii]Asindi AA, Ibia EO, Udo JJ: Mortality pattern in Nigerian children in the 1980s.
J Trop Med Hyg 1991, 94:152-5

[xxviii]Behrman RE: The field of paediatrics. In Nelson Textbook of Paediatrics.14th edition. WB Sanders Co, Philedephia; 1992:1-5
[xxix]De Galan-Roosen ,Kuijpers JC, Meershoek AP, van Velzen D. Contribution of congenital malformations to perinatal mortality. Eur J ObstetGynecolReprod Biol. 1998 Sep;80(1):55-61
[xxx] Le Hesran JY: The particularities of malaria in the child.Med Trop 2000, 60(10):92-98.
[xxxi] Fischer PR: Congenital Malaria: an African survey.ClinPediatr (Phila) 1997, 36(7):411-3
[xxxii]Nyirjesy, Paul, et al. "Malaria during pregnancy: neonatal morbidity and mortality and the efficacy of chloroquine chemoprophylaxis." Clinical infectious diseases 16.1 (1993): 127-132.
[xxxiii]Steketee RW, Wirima JJ, Slutsker L, Heymann DL, Breman JG: The problem of malaria and malaria control in pregnancy in sub-Saharan Africa.v
[xxxiv]McDermott JM, Wirima JJ, Steketee RW, Breman JG, Heymann DL: The effect of placental malaria infection on perinatal mortality in rural Malawi
[xxxv]Tako EA, Zhou A, Lohoue J, Leke R, Taylor DW, Leke RF: Risk factors for placental malaria and its effect on pregnancy outcome in Yaounde, Cameroon.
[xxxvi]Phibbs, Ciaran S., et al. "The effects of patient volume and level of care at the hospital of birth on neonatal mortality." Jama 276.13 (1996): 1054-1059.
[xxxvii]RabindraNath Roy et al. Mortality Pattern of the Hospitalised Children in a Tertiary Care Hospital of Kolkata. Indian Journal of Community Medicine, 2008 Jul:33(3), 187-9.
[xxxviii]ICMR Young Infant Study Group. Age profile of Neonatal Deaths. Indian Paediatrics, 2008 Dec 17: 45,991-4
[xxxix]Hafizur Rahman, Sandra Thompson,Mohammed Ali, NurulAlam, Md. Yunus, and Peter Kim Streatfield: Causes of Neonatal Deaths in a Rural Subdistrict of Bangladesh: Implications for Intervention: J Health PopulNutr. 2010 Aug; 28(4): 375–382
[xl]Marchant T, Willey B, Katz J, Clarke S, Kariuki S, Kuile Ft, et al. (2012) Neonatal Mortality Risk Associated with Preterm Birth in East Africa, Adjusted by Weight for Gestational Age: Individual Participant Level Meta-Analysis. PLoS Med 9(8): e1001292. doi:10.1371/journal.pmed.1001292
[xli]Alonso , Fuster V, Luna F.: Causes of neonatal mortality in Spain (1975-98): influence of sex, rural-urban residence and age at death.: J Biosoc Sci. 2006 Jul;38(4):537-51
[xlii]SohelyYasmin,DavidOsrin, Elizabeth Paul, & Anthony Costello: Neonatal mortality of low-birth-weight infants in Bangladesh: Bull World Health Organ vol.79 n.7 Genebra Jul. 2001
[xliii]Singh M. Hospital based data on perinatal and neonatal mortality in India. Jan-Mar 1986; Indian Paediatrics; 23:579-84.
[xliv]Umesh Y Ramadurg, C H Ghattargi, Gagan S, Manjula R, Ramesh Y Mayappanavar, Dip Bhadja, Sandhya S Nair: A Study of Causes of Neonatal Mortality in Tertiary Care Hospital, Bagalkot: International Journal of Health Information and Medical Research Vol: 1, Issue: 2, April 2014

TABLE:-

	DISEASE	MALES ADMITTED	FEMALES ADMITTED	TOTAL ADMISSIONS	TOTAL MORTALITIES	RATIO (mortality x 100 /admissions)
1	Birth asphyxia	50	47	97	26	26.80%
2	Sepsis	88	77	165	44	26.67%
3	Preterm + lbw< 1.5kg	37	40	77	46	59.74%
4	Preterm + lbw> 1.5kg	69	50	119	27	22.69%
5	meningitis	18	9	27	13	48.15%
6	Lbw< 2.5kg	116	96	212	72	33.96%
7	Neonatal jaundice	24	19	43	9	20.93%
8	tetanus	2	0	2	1	50.00%
9	Respiratory distress syndrome	64	49	113	39	34.51%
10	Pneumonia	4	4	8	3	37.50%
11	Congenital heart disease	3	1	4	2	50.00%
	TOTAL	475	392	867	282	32.52%