ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 03 | March - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

IMPACT OF INTENSIVE NRP TRAINING TO POINT OF CARE DOCTORS AND NURSES IN DECREASING ASPHYXIA RELATED NEONATAL MORBIDITY AND EARLY NEONATAL MORTALITY IN A MEDICAL COLLEGE HOSPITAL

Neonatology

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ABSTRACT

Objective-Perinatal asphyxia is a important cause of admission in sick newborn care unit. Intensive training on neonatal resuscitation of point of care doctors and nurses can change the asphyxia related outcome in a tertiary care hospital. **Design –** Before after study design. **Setting-**Tertiary care hospital delivery room and neonatal care unit. **Intervention-**Intensive neonatal resuscitation hands on training of point of care doctors and nurses as per neonatal resuscitation protocol by National Neonatology Forum. **Outcome-** There is significant decrease in perinatal asphyxia related admission in sick newborn care unit in after group. Early neonatal mortality also decreased. **Conclusion –** Increasing the awareness of appropriate and timely neonatal resuscitation at delivery point change the outcome of neonatal care unit of tertiary care hospital.

KEYWORDS

neonates ,perinatal asphyxia , neonatal resuscitation, mortality ,morbidity

INTRODUCTION-

In journey to decreasing neonatal mortality to single digit by 2030[1] decreasing perinatal asphyxia rate is very important. As perinatal asphyxia is an important cause of neonatal mortality[2],intensive neonatal resuscitation training to junior residents(house staffs, postgraduate students of Gynae and Obstetrics and Pediatrics) and nursing staffs and nursing students was done to decrease perinatal asphyxia related morbidly and mortality. Present study was done in Calcutta National Medical College Hospital ,Kolkata.

METHOD-

Calcutta National Medical College is in Kolkata city catering to both rural and urban poor community in Kolkata and south 24Parganas of West Bengal as tertiary referral centre. Total no of live born in the year 2018 was 11976. Total no of admissions of sick neonates was 1721 of total live born[14.7%].Perinatal asphyxia cases was 568[33%] of total live born. Total early neonatal mortality due to perinatal asphyxia was 104.[18.3%]of total asphyxial admission. Present study was planned in August 2019 in an attempt to decrease perinatal asphyxia related morbidity mortality. Neonatal resuscitation at delivery point is done by house staffs and MD,MS residents of both Pediatric Medicine and Gynae Obstetrics and by nursing staffs. Intensive training on NRINDIA guidelines was done by one to one hands on training by NNF(National Neonatology Forum) certified qualified trainer with mannequin along with live demonstration at delivery point. Both basic resuscitation upto positive pressure ventilation and advanced ventilation of cardiac massage, intubation, drugs were taught. Nursing staffs and trainee nurses were taught upto bag and mask and cardiac massage. Short word format of NRINDIA guideline was prepared and forwarded in the smartphones of all junior residents and nursing staffs. Daily feedback was received after their duty , any problems they were facing were solved. Group discussion among junior residents were arranged.

Certified provider course of central NNF NRINDIA guideline was arranged. Repeated hands on practice supervised every fortnightly by NNF certified trainer. Renovation of labour room and operation theatre was done . Availability of equipments and drugs was checked and ensured. The resuscitation done was recorded as requirement of initial steps, bag and mask , cardiac massage, intubation ,drugs etc. All resuscitation at delivery point was videographed and point to point analysis of each activity with time limit was done for all participants. Time requirement and appropriate sequence of all activities was checked. Neonates requiring more than 1minute of bag and mask ventilation was shifted to sick newborn care unit. Present study was planned as before after study design for outcome assessment. Intensive training period was on August 2019 for one month. December 2018 to July 2019 was taken as before group and September 2019 to April 2020 was taken as after group. The outcome difference among the two groups was compared. Maternal care during antenatal, natal and postnatal period was done as per hospital protocol.

RESULTS –

Impact of intensive NRP training was judged by before after study design .December 2018 to July 2019, 8 months period(before group) was compared to September 2019 to April 2020(after group).

Table1 Showing Death And Admission In Asphyxia Cases From January To August 2019

	No of live born	total sncu adm	asphyxia adm	total sncu death	asphyxia death
Dec2018	885	121	37	23	7
Jan2019	928	148	43	16	4
Feb2019	1075	163	44	33	7
March 2019	1226	141	53	44	14
April2019	1179	141	52	41	8
May2019	1270	155	62	27	15
June 2019	1168	150	54	29	12
July2019	929	122	35	16	5
	8660	1141	380	229	72

In before group ,total live born was 8660,of which 1141 cases(13.1%) required admission in sick newborn care unit. Perinatal asphyxia was reason for admission in 380 cases(33.3%).Total death was 229,(20%) of total admission. Death due to perinatal asphyxia was seen in 72 cases, which was 31.44% of total death and 18.9% of total perinatal asphyxia admission.

Table2. Asphyxial Admission And Death After Intervention

	Live born	total sncu adm	asphyxia adm	total death	asphyxia death
September 2019	732	91	26	19	1
Oct2019	562	70	17	9	3
Nov2019	828	89	27	17	4
Dec2019	799	94	23	20	2
Jan2020	875	110	26	22	5
Feb2020	724	88	22	17	2
March2020	900	80	18	17	2
April2020	1018	116	21	25	4
	6438	738	180	146	23

Total SNCU admission in Sept 2019 –April 2020 was 738,(11.4%) of total live born. Perinatal asphyxia was the reason of admission in 180 cases which was 24.3% of total admission. Total death in this period was 146, which was 19.7% of total admission. Asphyxia was cause of death in 23 cases , which was 15.7% of total death and was 12.7% of total asphyxia admission.

Table 3 Showing Basic Demographic Data Of The Study Population

	before	after	pvalue
Sex m/f	227:154	119:61	0.16
Mean birth wt	2.57kg(+-0.47)	2.67(+-0.46)	0.53
Term:preterm	321:61	158:22	0.29
ND:LSCS	209:171	87:93	0.1478

There is no significant difference in the before and after group among male, female, term, preterm, type of delivery and mean birth weight.

Table4 Showing Maternal Data Of Before And After Group
MATERNAL DATA FROM SICK ASPHYXIAL NEONATES ADMITTED in SNCU

Condition	before	after	pvalue
MSL	45	32	0.0658
PIH	30	30	<0.0001
OLIGOHYDRAMIOS	19	7	0.6700
ECLAMPSIA	13	2	0.1614
PROLNG LABOUR	24	17	0.2234
CTG ABNORMAL	21	17	0.154
APH	11	6	0.7948
PROM	3	6	0.0344
GDM	2	0	1.000

There is no significant difference in the maternal condition in before and after group except PIH cases and prolonged rupture of membrane cases were less in after group.

Table 5 Showing The Difference In Sick Newborn Care Unit Admission And Death In Before And After Group

	Dec2018-July 2019	Sept2019-April 2020	P value
Total live born	8660	6438	
Total sncu admission	1141	738	0.0017 (out of total admissions)
Asphyxia admission	380	180	<0.0001 (out of total admissions)
Total death	229	146	0.1534 (out of total admissions)
Asphyxia death	72	23	0.0002 (out of total admissions) 0.0006 (out of total deaths)

There is significant reduction in perinatal asphyxia related admission and death in after group.

Table 6 Showing Absolute And Relative Risk Reduction Of Perinatal Asphyxia Related Admission
ASPHYXIAADMISSIONS

ASPHYXIA ADMISSIONS	BEFORE	AFTER	Grand Total
Not Required	380	180	560
Required	8280	6258	14538
Grand Total	8660	6438	15098

Relative risk of admission in AFTER group as compared to BEFORE group 0.6372 (95% CI 0.0.5352 to 0.7586). p value <0.0001 (statistically significant).

Absolute risk reduction: 1.59% of patients will not experience admission in the AFTER time period that they would have in BEFORE time period. 95% confidence interval: [1.00%to 2.18%].

Table 7 Showing Absolute And Relative Risk Reduction Of Perinatal Asphyxia Related Death In After Group
MORTALITY

STATUS	BEFORE	AFTER	Grand Total
Not Expired	312	154	466
Expired	70	26	96
Grand Total	382	180	562

Relative risk of death in AFTER group as compared to BEFORE group 0.7883 (95% CI 0.5211 to 1.1923). p value = 0.2597 (not statistically significant).

Absolute risk reduction:
3.88% of patients will not experience mortalityin theAFTER time period that they would have inBEFORE time period. 95% confidence interval: [-2.56% to 10.32%].

DISCUSSION

In developing countries like India, birth asphyxia, sepsis, pneumonia and prematurity continue to constitute a major portion of infant mortality rate(6). The WHO estimates that 40%-60% of neonatal deaths from these causes are preventable(7). Almost half of under-five deaths are newborns, yet about 80% of these are preventable using cost-effective interventions(8). Baqui and colleagues estimated that most deaths in birth asphyxia occurs in first week of life in rural India(9).A systematic analysis of global, regional and national causes of child mortality in 2013 identified preterm birth complications and infections to be the two major causes of neonatal deaths in India .(1,4) The review, which included the data from the Million Death Study from India,(5) found perinatal asphyxia and malformations to be the other two significant causes of neonatal mortality. These findings are very similar to the overall global pattern.(4)According to Liu et al(4) intrapartum related complications/ birth asphyxia is an important cause of neonatal mortality in India causing about 20% deaths. Despite significant progress in reducing global mortality in children aged <5 years as called for in the United Nations' Millennium Development Goal 4, neonatal mortality rates and deaths due to birth asphyxia in particular have failed to improve at the same rate as other child health indicators and, in some areas, have remained stagnant(1).

Present study was planned in a Medical College Hospital catering to rural and urban poor having high incidence of perinatal asphyxia related morbidity and mortality. Increased awareness and appropriate neonatal resuscitation by point of care doctors and nurses can improve the hospital outcome. In this study there is decrease in perinatal asphyxia admission in sick newborn care unit. Lee etal (10)in a metaanalysis concluded that neonatal resuscitation training in facility setting reduced intrapartum-related deaths by 30% (RR=0.70; 95% CI 0.59, 0.84).Pammi et al in his study(11) documented that neonatal resuscitation training decreases neonatal mortality. Deorari et al in his study has shown that a NRP programme at 14 teaching tertiary care hospitals in India documented improvement in resuscitation practices and significant decline in asphyxia related deaths(12). The obstetric management and protocol was same in both the groups . The maternal base line data revealed more detection of hypertension and prolonged rupture of membrane in after group. So the changes in outcome can be correlated to the resuscitation performances.

CONCLUSIONS-

Appropriate and timely application of neonatal resuscitation protocol can improve the outcome of a tertiary care hospital.

REFERENCES-

1. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE et al. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet 2015; 385(9966): 430–440.
2. Registrar General of India. Sample registration system (SRS) statistical report 2013. New Delhi: 2013.
3. World Health Organization. WHO Data. Available at http://data.un.org/Explorer.aspx?d=WHO (accessed on 20 August 2014).
4. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. Lancet 2012; 379: 2151–2161.
5. Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, Shet A et al. Causes of neonatal and child mortality in India: a nationally representative mortality survey. Lancet 2010; 376: 1853–1860.
6. LawnJE,Kinney MV, BlackRE etal. Newborn survival :a multi country analysis of a decade of change.Health policy plan.2012;27:iii-iii2
7. World Health Organization, UNICEF. Every newborn: An action plan to end preventable deaths. Geneva: WHO; 2014.http://www.everynewborn.org/Documents/Full-action-plan-EN.pdf.
8. Akseer N,LawnJE,KeenanW,Konstantopoulos Aetal. Ending preventable newborn death in a generation.International Journal of Gynaecology and Obstetrics 2015;131:s43-s48
9. Baqui AH, Darmstadt GL, Williams EK, Kumar V, Kiran TU, Panwar D, Srivastava VK, Ahuja R, Black RE, Santosham M.. Rates ,timing and causes of neonatal deaths in rural India:implications for neonatal health programmes. Bull World Health Organ.2006;84:706
10. Lee AC, Cousens S, Wall SN, Niermeyer S, Darmstadt GL, Carlo WA, *et al*. Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: A systematic review, meta-analysis and Delphi estimation of mortality effect. BMC Public Health. 2011;11:S12.
11. Pammi M, DempseyEM, Anthony Ryan C,BarringtonKJ. Newborn Resucitation Training Programmes reduce early neonatal mortality .Neonatology 2016 ;110:210-224
12. Deorari AK, Paul VK, Singh M, Vidyasagar D. Impact of education and training on neonatal resuscitation practices in 14 teaching hospitals in India. Ann Trop Paediatr. 2001;21:29-33.