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Is Social Backwardness a determinant of preterm Birth and adverse neonatal outcome? a hospital-based study from a Tertiary care hospital in eastern India.

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Introduction

Children born to poor families are at risk of developing several diseases due to inadequate water and sanitation, indoor air pollution, crowding and poor housing conditions. [1]Access to clean water supply, and sanitation and good hygienic practices, especially at delivery points, is crucial for a safe delivery, and prevention of maternal and newborn mortality and morbidity. Creating conditions for better hygiene and reduced exposure to contamination makes children less susceptible to diseases and infections that may lead to death. [2,3,4]

In India's caste-based social hierarchy, the scheduled castes (SCs), Dalits, Adivasis and Scheduled tribes (STs) are the most backward and disadvantaged. Study shows has higher vulnerability of SC children as compared with ST children: the odds of neonatal mortality among STs are lower by 28% as compared with SC communities in rural areas. [2] Family characteristics contribute significantly in determining the status of newborn health. [5] There are lack of studies to explore social backwardness as a determinant to prematurity.

Aims and objectives

To show whether social backwardness is a determinant of preterm birth and adverse neonatal outcome.

MATERIALS AND METHODS

A detailed research proposal was submitted to the Institutional Scientific Review Committee of College of Medicine and JNM Hospital, Kalyani, Nadia, West Bengal, India. Following their approval, the proposal was forwarded to the Institutional Ethics Committee. Upon their approval, data from the hospital record section wasrecoveredand bed head tickets were collected. We had done a detailed review of the BHTs and collected the necessary data. Collected data was presented in tabulated form and was analyzed using Microsoft Excel 2016 software. We had done an observational studyon the neonates admitted to the SNCU (both inborn and out-born) over a period of three years 2019 to 2021.

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Statistical analysis

Data were entered in Microsoft excel 2016 and analyzed.

RESULTS

The present study focused on the difference in occurrence of prematurity among different social categories like General, OBC, SC, ST etc. along with any difference in adverse neonatal outcome, namely neonatal mortality among all babies admitted to the SNCU.

Table no 1.1 shows number of preterm births among different social categories over a three-year period (2019-2021).

	General		OBC		SC		ST	
Year	Total no of newborn	Preterm Births	Total no of Newborn	Preterm births	Total number of Newborns	Preterm Births	Total number of Newborns	Preterm Births
2019	1189 (53.8%, n=2210)	457 (53.13%, n=860)	540 (24.4%)	231 (26.86%)	415 (18.8%)	147 (17.09%)	66 (3.0%)	25 (2.9%)
2020	824 (53.92%, n=1528)	389 (51.86%, n=750)	411 (26.9%)	216 (29.7%)	252 (16.5%)	122 (16.26)	41 (2.7%)	23 (3.06%)
2021	756 (47.5%, n=1590)	279 (45.07%, n=619)	442 (27.8%)	191 (30.85%)	314 (19.7%)	110 (17.77%)	78 (4.9%)	39 (6.03%)

In 2019, total number of neonates admitted to the SNCU including all the social categories were 2210. Among these 860 were premature. The number of newborns born in families from the four categories are 1189 (53.8%), 540 (24.4%), 415 (18.8%) and 66 (3%) respectively. Whereas the number of premature born in families from these categories are 457(53.13%), 231 (26.86%), 147 (17.09%) and 25 (32.9%).

In 2020, the total number of neonates admitted in SNCU was 1528, out of which 750 were preterm. The number of newborns born in families from the four categories are 824 (53.92%), 411 (26.9%), 252 (16.5%) and 41 (2.7%) respectively. Whereas the number of premature born in families from these categories are 389 (51.86%), 216 (29.7%), 122 (16.26%) and 23 (3.06%).

In 2021, the total number of neonates admitted in SNCU was 1590, out of which 619 were preterm births. The distribution of neonates born in families in each category was 756 (47.5%)

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for general category, 442 (27.8%) for OBC, 314 for SC and 78 (4.9%) for ST. The number of preterm births among these categories are 279 (45.07%), 191 (30.85%), 110 (17.77%) and 39 (6.03%), respectively.

Table 1.2 shows number of preterm deliveries among general and socially backward categories (SC, ST, OBC).

Table 1.2 No of preterm birth among general and Socially backward categories			
Year	General	Socially backward categories (SC, ST, OBC)	Significance level
	Preterm	Preterm	
2019	457 (53.13%, n=860)	403 (46.86%)	.549
2020	389 (51.86%, n=750)	361 (48.13%)	.842
2021	279 (45.07%, n=619)	340 (54.92%)	.317

The table 1.2 depicts comparison between occurrence of prematurity among babies born in families from socially non-backward class families (namely, General category) and babies born among socially backward class families (SC, ST, OBC categories) bovver a three-year period, from 2019 to 2021.

In 2019, 457 preterm babies were among the General category, which constitutes about 53.13% of the total number of preterm deliveries that year (860). Whereas total number of preterm babies born in families from socially backward class families were 403(46.86%, n=860). The difference among these two categories is not statistically significant (P=.549).

In 2020, 389(51.86%, n=750) preterm babies were born among the Socially non-backward categories, whereas 361(48.13%) preterm babies were born from families from socially backward categories. The difference among these two categories is not found to be statistically significant (p value.842).

In 2021, 279(45.07%, n=619) preterm babies were born into families from general categories and 340(54.92%) babies were born into socially backward class families. This sows more number of babies born to families from socially backward class categories, but again fails to show statistical significance (p=.312)

Outcome among all the newborn in the four categories are tabulated in table no 1.3

Table no 1.3 neonatal outcome among different social categories					
Year	Outcome	General	OBC	SC	ST
2019	Discharged	945 (79.47%)	452 (83.70%)	359 (86.50%)	52 (78.78%)
	Referred	122 (10.26%)	34 (6.29%)	24 (5.78%)	4 (6.06%)
	LAMA	43 (3.61%)	18 (3.33%)	12 2.89%)	3 (4.54%)

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	Expired	79 (6.64%)	36 (6.66%)	18 (4.33%)	6 (9.09%)
2020	Discharged	606 (73.54%)	307 (74.69%)	204 (80.95%)	31 (75.60%)
	Referred	62 (7.52%)	24 (5.83%)	11 (4.36%)	0 (0%)
	LAMA	45 (5.46%)	30 (7.29%)	16 (6.34%)	6 14.63%)
	Expired	111 (13.47%)	50 (12.16%)	21 (8.33%)	4 (9.75%)
2021	Discharged	599 (79.23%)	343 (77.60%)	245 (78.02%)	59 (75.64%)
	Referred	39 5.15%)	21 (4.75%)	23 (5.20%)	4 (5.12%)
	LAMA	38 (5.02%)	26 (5.88%)	11 (3.50%)	3 (3.84%)
	Expired	80 (10.58%)	52 (11.76%)	35 (11.14%)	12 (15.38%)

Table No 1.4 Neonatal Mortality among Neonatal outcome among different social categories

Year	Neonatal mortality among General Category	Neonatal mortality among Socially Backward Categories (SC, ST, OBC)	Significance level
2019	79 (6.64%, n=1189)	60 (5.89%, n=1018)	.464
2020	111 (13.47%, n= 824)	75 (10.65%, n=704)	.096
2021	80 (10.58%, n=756)	99 (11.87%, n=834)	.413

It is clearly seen from the table 1.4 that, in 2019, neonatal mortality among all four categories (General, OBC, SC, ST, respectively) were 6.64%, 6.66%, 4.33% and 9.09%. Whereas, in 2020 neonatal mortality was 13.47%, 12.16%, 8.33% and 9.75% respectively. In 2021, neonatal mortality was 10.58%,11.76%,11.14% and 15.38%, respectively.

It is also seen that the mortality rates among neonates born into Socially backward class families does not differ significantly from babies born into socially non backward class families (p values.464,.096,.413, for 2019, 2020 and 2021 respectively)

DISCUSSION

Our present study is an endeavour to assess the validity of social backwardness as a determinant of premature birth or adverse neonatal outcome (namely neonatal mortality).

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As the study showed, the number of premature births in the general category does not differ significantly from the number of premature babies born in the Socially backward categories (Sc, ST, OBC) in the years 2019, 2020 & 2021. In other words, prematurity is not more frequently associated with any social categories as per our current study. Although, a community based study will probably be more apt to determine any difference among occurrence of premature births among these categories.

Neonatal mortality is affected by socioeconomic, community level and proximate biological determinants. This has been validated in several studies. [6,7]Upadhyay et al. [6] found that low educational status of parents (odds ratio (OR) 2.1, 95% CI; 1.4, 3.3), father's occupation (OR 1.8, 95% CI; 1.0, 3.0) and caste (OR 2.0, 95% CI; 1.2, 3.4) appears to explain a major fraction (45.7%) of neonatal deaths in Haryana. Our present study, however finds no significant difference in neonatal mortality among the socially backward (SC, ST, OBC, etc) and general category. This contradicts with the findings of several previous studies. [6,7] However, this discrepancy in finding may be due to huge diversity in socio-cultural factors in different states in a hugely diverse country like India

Rai et al. [8] conducted a study which include several social and demographic parameters and it concludes that higher maternal education was associated with reduced risk of preterm births andsmall for gestational age (SGA). Another study [9] conducted in Denmarkconsidering socioeconomic factors and concluded that the risk of preterm birth increased with decreasing educational level and increasing severity of mental health conditions. However this study not considered any caste factors which is a prominent factor in India.

Study conducted by Bora et al [10] focused on influence of caste system on under-five mortality and found that children belonging to the SC and ST population experience higher mortality rates than children belonging to the non-SC/ST population. However this study was not focus to preterm birth among different caste categories. Our present study was focused on that aspect.

Limitations of our study

Due to huge diversity in culture and social circumstances in India, the present study may not hold true for all states and regions and a simple generalization cannot be made about the whole country. A more robust and multicentric and study is required to assess the ground realities prevailing at the community level.

CONCLUSIONS

Thus, in this present study it appears that, being born to families belonging to any social categories are not associated with increased risk of prematurity. It also shows that, being born to socially backward families are not associated with adverse neonatal outcome, such as neonatal mortality, at least in this geographical area. Therefore, the present study fails to show that social backwardness is a determinant of Preterm birth. However, a more robust and probably a community-based study is necessary for consolidating the study findings.

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REFERENCES

1. Victora CG, Wagstaff A, Schellenberg JA, Gwatkin D, Claeson M, Habicht JP. Applying an equity lens to child health and mortality: more of the same is not enough. Lancet 2003; 362(9379): 233–241.
2. Singh A, Kumar A, Kumar A. Determinants of neonatal mortality in rural India. 2007–2008. Peer J2013; 1: e75.
3. Fewtrell L, Kaufmann RB, Kay D, Enanoria W, Haller L, Colford JM Jr. Water, sanitation, and hygiene interventions to reduce diarrhoea in less developed countries: a systematic review and meta-analysis. Lancet Infect Dis 2005; 5(1): 42–52.
4. United Nations Children Fund (UNICEF)State of World Children: Maternal and Newborn Health. UNICEF: New York, USA, 2009.
5. Sankar, M., Neogi, S., Sharma, J. et al. State of newborn health in India. J Perinatol 36, S3–S8 (2016). https://doi.org/10.1038/jp.2016.183
6. Upadhyay RP, Dwivedi PR, Rai SK, Misra P, Kalaivani M, Krishnan A. Determinants of neonatal mortality in rural Haryana: a retrospective population based study. Indian Pediatrics 2012; 49(4): 291–294.
7. Kabir Z. Demographic and socio-economic determinants of post-neonatal deaths in a special project area of rural northern India. Indian Pediatr. 2003 Jul;40(7):653-9. PMID: 12881622.
8. Rai RK, Sudfeld CR, Barik A, Fawzi WW, Chowdhury A. Sociodemographic determinants of preterm birth and small for gestational age in rural West Bengal, India. Journal of Tropical Pediatrics. 2019 Dec;65(6):537-46.
9. Knudsen CK, Christesen AM, Heuckendorff S, Fonager K, Johansen MN, Overgaard C. The risk of preterm birth in combinations of socioeconomic position and mental health conditions in different age groups: a Danish nationwide register-based cohort study. BMC pregnancy and childbirth. 2021 Dec;21(1):1-1.
10. Bora JK, Raushan R, Lutz W. The persistent influence of caste on under-five mortality: Factors that explain the caste-based gap in high focus Indian states. PloS one. 2019 Aug 20;14(8):e0211086.

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