

Comparative Study Of Health Status Of The Newborns Belonging To Below Poverty Line And Above Poverty Line Families

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Abstract: Background: Newborn health is the key to childhood health and survival. Socioeconomic factors play a very important role in maternal health and wellbeing thus they can also influence newborn health and survival. Objective of the present study is to compare newborn health outcome between below poverty line (B.P.L.) and above poverty line (A.P.L.) families. Method: history and physical examination of total 60 newborns were done thoroughly and they were divided in two groups, B.P.L. and A.P.L. groups. Data was analyzed statistically. Result: Number of low birth weight (L.B.W) babies is significantly higher in B.P.L. group as compared to A.P.L. group. B.P.L. mothers visited hospital during their antenatal period lesser number of times than A.P.L. mothers and this difference was statistically significant. Conclusion: Present study shows that 37% newborns of B.P.L. group and 10% newborns in A.P.L. group are L.B.W. It is concluded from the present study that poverty increases the incidence of low birth weight in newborns. Also poverty negatively influences antenatal care practices. It's evident that by controlling poverty we can control adverse newborn health outcomes and thus we can improve maternal as well as newborn health.

Key Words: Newborn, neonate, newborn health, low birth weight, poverty and low birth weight, newborn anthropometric indices.

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Introduction: After birth, life begins in the form of a newborn. Newborn health is the key to childhood health and survival. Newborn or neonate (from Latin, neonatus, newborn) refers to an infant in the first 28 days after birth.¹The neonatal period contains the most dramatic and rapid physiological changes seen in human life.

A detailed history taking and clinical examination should be performed on all newborn babies, usually within the first 48 hours of life.

Neonatal deaths account for 40% of all deaths among children under five. The majorities of all neonatal deaths (75%) occur during the first week of life and 25% to 45% of all deaths occur within the first 24 hours. The main causes of newborn deaths are prematurity and low-birth-weight, infections, asphyxia and birth trauma. These causes account for nearly 80% of deaths in this age group.² The Neonatal Mortality rate in India is 32 per 1000 live births, as per 2010 according to a UNICEF report.³

Newborn care is strongly influenced by mother's social and health status and by family care and practices for mother and newborn, as well as by

maternal and newborn care services.⁴Most deaths of newborn babies occur at home, among poor families, and are associated with inadequate maternal health care during pregnancy and childbirth. Lack of maternal health services such as antenatal care and skilled birth attendants are a large part of the problem. A large proportion of the babies who die can be saved with low-tech, low-cost interventions, which would also help save the lives of mothers and prevent stillbirths.⁵Socioeconomic factors play a very important role in maternal health and wellbeing. If proper care is given during pregnancy, neonatal health outcome can be improved.

Few population-based studies have examined the relation between newborn health and family poverty.^{14,15,16} Adverse reproductive outcomes such as low birth weight (L.B.W.), preterm delivery, intrauterine growth retardation (IUGR) are recognized as important determinants not only of infant mortality but also of health outcomes occurring over the entire life course.⁶ Thus, an important goal for public health policy ought to be socioeconomic equity in birth outcomes. This is because health in early life affects health later in life. Ben-Sholmo et al, 2002⁷ and Harding et al,

2001⁸ demonstrated that several diseases of public health significance occur due to intrauterine and early life influences. Present study attempts at finding the relationship between socio economic status of the family and health status of the newborn. Since determination of poverty in India is based on Below Poverty Line (B.P.L.) list and card, we are going to compare health status of newborn belonging to B.P.L. card holder i.e., B.P.L. families and non B.P.L. card holder, i.e., Above Poverty Line (A.P.L.) families.

Aim and Objectives:

1. To assess health status of newborns belonging to Below Poverty Line (B.P.L.) families and Above Poverty Line (A.P.L.) families. By term health status we mean indicators of newborn health at birth i.e., birth weight, anthropometric indices, general and systemic examination of newborn and neonatal reflexes.
2. To compare low birth weight babies between newborns belonging to B.P.L. and A.P.L. families.
3. To compare practices regarding health care of newborn and antenatal visits by mother between B.P.L. and A.P.L. families.

Material and Method: In our country, demarcation between poor and non poor family is based on 'Poverty Line'. There are specific criteria and scoring system to identify a family as a B.P.L. family, each B.P.L. family is given a B.P.L. card and the family which does not fulfill criteria for B.P.L., is classified as Above Poverty Line (A.P.L.) family.

The present study was an observational type of study which was conducted from June, 2011 to December, 2012 on total 60 newborns, 30 newborns belonging to Below Poverty Line (B.P.L.) and 30 newborns belonging to Above Poverty Line (A.P.L.) families at Civil Hospital Ahmedabad and a private hospital in Gujarat. A thorough history taking and examination of each newborn was done. A written consent from parent/guardian of each newborn was taken.

Criteria for selecting a newborn belonging to B.P.L. family:The newborn belonging to a family possessing B.P.L. card issued by Government of Gujarat was classified as a newborn belonging to B.P.L. family.

Criteria for selecting a newborn belonging to A.P.L. family:The newborn belonging to a family which did not have B.P.L. card issued by Government of Gujarat was classified as a newborn belonging to A.P.L. family.

Exclusion criteria for both groups:

Preterm newborn.

Newborn having critical illness, admitted in Neonatal Intensive Care Unit (NICU).

Methodology:Criteria for assessing health status of the newborn include:

A. History:

1. Basic Information
2. Perinatal History.
3. Intrapartum history.
4. History of newborn after birth.

B. Examination:

1. General Examination
2. Neonatal Reflexes
3. Anthropometry
4. Systemic Examination

Neonatal reflexes: Sucking reflex, rooting reflex, moro's reflex, asymmetric tonic neck reflex, palmar grasp, plantar grasp and stepping reflex of all newborns were assessed.

Anthropometry: Birth weight and other measurements: birth weight of newborn is recorded in kilogram (kg) using a weighing scale. It is measured just after the birth. In our case, we took the record of birth weight taken at the time of birth by the hospital staff.

Statistical analysis: The data was analyzed using Fisher's exact test, using statistical software GraphPadInstat trial version.

Result:The present study was performed on total 60 newborns. Out of these 60, 30 newborns belonging to B.P.L. and 30 to A.P.L. families were examined for different parameters indicating their health status and result was compared statistically.

Table 1 :Number of Low Birth Weight (L.B.W.) babies in each group:

Groups	Number of Low birth weight babies	Number of normal birth weight babies	Total babies
B.P.L	11	19	30
A.P.L	3	27	30
Total	14	46	60

P value = 0.0303, Relative risk = 3.667.

No. of low birth weight babies are significantly higher in B.P.L. group as compared to A.P.L. group.

Table 2 : No. of breastfed and topfed newborns in each group.

Group	Number of Breast fed newborns	Number of Top fed newborns	Total babies
B.P.L	24	6	30
A.P.L	24	6	30
Total	48	12	60

There are equal numbers of breastfed and top-fed newborns in each group, therefore practice of breast feeding is equally prevalent in both groups.

Table 3: Number of male and female newborns in each group:

Group	Number of male newborns	Number of female newborns	Total newborn babies
B.P.L	18	12	30
A.P.L	14	16	30
Total	32	28	60

No. of male babies are higher and no. of female babies are lower in B.P.L. group than A.P.L. group, but this difference is not significant statistically.

Mean antenatal visits of B.P.L. was 6.17 ± 2.18 and Mean antenatal visits of A.P.L. was 7.36 ± 2.21

Applying unpaired t-test, $P= 0.0384$, which is considered significant, $t = 2.119$ with 58 degrees of freedom. The above result indicates that A.P.L. group of mothers have taken more antenatal visits as compared to B.P.L. group of mothers.

Table 4: Number of newborns born by normal and Caesarean section delivery in each group:

Group	Newborns born by normal delivery (N)	Newborns born by Caesarean section delivery(N)	Total
B.P.L.	11	19	30
A.P.L.	14	16	30

There is higher number of normal deliveries in A.P.L. group but this difference is not statistically significant. ($p > 0.05$)

Table 5: Newborn gender and L.B.W. babies:

Gender	L.B.W. babies	Normal weight babies	Total
Male	7	25	32
female	7	21	28

The above table suggests overall numbers of L.B.W. and normal birth weight babies in male and female groups, there is no significant difference in both groups between no. of L.B.W. and normal weight babies.

Table 6: Comparison of anthropometric parameters of both groups:

Parameter	B.P.L.	A.P.L.
Mean birth weight (Kg)	2.72 ± 0.45	2.71 ± 0.39
Mean crown heel length (cm)	48.1 ± 2.93	48 ± 2.82
Mean head circumference (cm.)	33.3 ± 1.70	33.35 ± 1.49
Mean chest circumference (cm.)	31.23 ± 2.14	32.12 ± 2.27
Mean Upper segment : lower segment ratio	1.58 ± 0.13	1.62 ± 0.08

There are not significant differences between anthropometric parameters of both groups. But significant difference is there between numbers of low birth weight babies between both groups as we have seen earlier.

Discussion: Present study shows that 37% newborns of B.P.L. group and 10% newborns in A.P.L. group are L.B.W. Other studies indicate the

prevalence of low birth weight range from 20% to 40% in India.^{9,10}

The birth weight of a newborn is a significant determinant of neonatal and postnatal infant mortality.¹¹ It is potentially a useful parameter for measurement of health during the vulnerable periods of life and serves as a useful indicator of health of the community because it is sensitive to environmental and socio-economic influences.¹²

L.B.W. has been associated with a high infant mortality, morbidity in childhood and with an elevated risk of diabetes mellitus, hypertension and other cardiovascular diseases in adulthood.¹³ Low maternal socioeconomic status is stated as the principal determinant of a L.B.W.¹⁴ The association of a low socio economic status with L.B.W. has been reported previously.^{15,16} Such an association may be related to several potential mechanisms. An important mechanism is poor nutritional intake by mother during pregnancy which is more likely in the low socioeconomic status groups and related to certain cultural practices.¹⁷

In the Netherlands, Verkerk et al.,¹⁸ concluded that infants of very low social class are at increased risk for low birth weight for gestational age. Similarly socioeconomic inequalities in L.B.W. in England and Wales were described by Pattenden et al.,¹⁹. They concluded that up to 30% of L.B.W. can be seen as being associated with levels of socioeconomic deprivation below that of the most affluent group. According to the Tuntiseranee et al.,²⁰ in Thailand, poor pregnancy outcome reported in the disadvantaged social class. Cramer²¹ showed that women with higher income had larger babies and in a study in Malaysia, DaVanzo et al.,²² found that income was correlated with birth weight.

There is a significant difference in number of antenatal visits taken by mother between both groups. B.P.L. mothers visited hospital during their antenatal period lesser number of times than A.P.L. mothers and this difference was statistically significant. Early commencement of antenatal care by pregnant women as well as regular visits has the potential to affect maternal and foetal outcome positively.^{23, 24, 25} According to Beekman et al²⁶, the influence of predisposing determinants on the

number of antenatal visits show a trend towards fewer antenatal visits in socioeconomically disadvantaged women. Petrouet al.²⁷ observed the importance of geographical origin in relation to the number of antenatal visits. White British women had the highest number while Pakistani women had the lowest number of antenatal visits. The study of Hildingsson et al.²⁸ found no relationship with origin. In contrast with findings of the present study, they found that more highly educated women belonged more often to the group receiving fewer antenatal visits compared with the standard schedule.

Conclusion: Number of low birth weight babies is significantly higher in B.P.L. group as compared to A.P.L. group. Present study shows that 37% newborns of B.P.L. group and 10% newborns in A.P.L. group are L.B.W. Therefore, it is concluded from the present study that poverty increases the incidence of low birth weight in newborns.

- In both groups, there are equal numbers of breastfed and top-fed newborns.
- 60% of B.P.L. newborns and 47% of A.P.L. newborns are male and 40% of B.P.L. newborns and 53% of A.P.L. newborns are female.
- B.P.L. mothers visited hospital during their antenatal period lesser number of times than A.P.L. mothers and this difference was statistically significant.

Children belonging to poor families experience higher risk to attain poor outcomes in various aspects of life. These outcomes comprise children's cognitive, social and emotional development, school achievements, health and overall wellbeing.

In our study, we can conclude that poverty is associated with increased low birth weight babies. Government is trying hard to reduce the difference of health outcomes between poor and non poor families by implementing JananiSurakshaYojana, ChiranjeeviYojana and BalsakhaYojana but perhaps it would take some time for narrowing the difference in health outcome between poor and non poor families.

Antenatal care is a key component of a healthy pregnancy. Regular antenatal care helps to identify the problems during pregnancy and treat complications early and thus helps to promote

healthy newborn outcome. In our study, we can conclude that B.P.L. mother had taken significantly lesser antenatal visits than A.P.L. mother and also number of low birth weight babies was significantly greater among B.P.L. newborns as compared to A.P.L. newborns. Thus, regular antenatal visits can help to achieve better newborn health.

References:

1. Merriam-Webster online dictionary; Neonate; Retrieved December, 19, 2012 from <http://www.merriam-webster.com/dictionary/neonate>.
2. WHO Newborns: reducing mortality May 2012 Fact sheet N°333; Retrieved November, 24, 2012 from <http://www.who.int/mediacentre/factsheets/fs333/en/index.html>
3. Level & Trends in Child Mortality. Report 2011. Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA, UNPD); Retrieved December, 1, 2012 http://www.childinfo.org/files/Child_Mortality_Report_2011.pdf
4. Bulatao R, Ross J; Rating maternal and neonatal health programmes in developing countries; 2000; Retrieved on December 3, 2012 from http://pdf.usaid.gov/pdf_docs/PNACL165.pdf.
5. Koiri P, Effect of Health Services and Socio-Economic Factors on Neonatal Mortality in India: Case Study of EAG States :International Journal of social sciences tomorrow: 1 (9): Nov 2012; Retrieved December, 24, 2012 from <http://www.ijst.com/issue/906.pdf>.
6. Barker, D.J., 1995. The foetal and infant origins of disease. European Journal of Clinical Investigation 25, pp. 457-463.
7. Ben-Shlomo Y., and Kuh D., 2002. A life course approach to chronic disease epidemiology:conceptual models, empirical challenges and interdisciplinary perspectives. International Journal of Epidemiology 31, pp. 285-293.
8. Harding, J.E., 2001. The nutritional basis of the fetal origins of adult disease. International Journal of Epidemiology 30, pp. 15-23.
9. Verma KC. Premature baby. Quart Med Rev 1982, 33: 3-19.
10. Trivedi CR, Mavalankar DV. Epidemiology of low birth weight in Ahmedabad. Indian J Pediatr 1986. 53:795-800.
11. McCormick MC. The contribution of low birth weight to infant mortality and childhood morbidity. N Engl J Med 1985, 312: 82-90.
12. Kumar V, Datta N. Birth weight as an indicator of health. Indian Pediatr 1984, 21: 113-118.
13. Barker DJP. Fetal origins of coronary heart disease. BMJ 1995; 311: 171-174.
14. T. Radhakrishnan, K.R. Thankappan, R.S. Vasan, P.S. Sarma :Socio Socioeconomic and Demographic Factors Associated with Birth Weight: A Community Based Study in Kerala, Indian Pediatrics 2000;37: 872-876.
15. Deshmukh JS, Motghare DD, Zodpey SP, Wadhva SK. Low birth weight and associated maternal factors in an urban area. Indian Pediatrics 1998; 35: 33-36.
16. Hirve SS, Ganatra BR. Determinants of low birth weight: A community based prospective cohort study. Indian Pediatr 1994; 31: 1221-1225. http://whqlibdoc.who.int/publications/2009/9789241597494_eng.pdf http://www.childinfo.org/files/low_birthweight_from_EY.pdf Investigation 25, pp. 457-463.
17. Panikar PGK, Soman CR. Health Status of Kerala. Paradox of Economic Backwardness and Health Development. Center for Development Studies,Thiruvanthapuram, 1984; p 26.
18. Verkerk, P.H., Zaadstra, B.M, Reerink, J.D., Hengreen, W.P., and Verloove-Vanhorick, S.P., 1994. Social class, ethnicity and other risk factors for small for gestational age and preterm delivery in the Netherlands. European Journal of Obstetrics and Gynecology and Reproductive Biolog 53(2), pp. 129-134.
19. Pattenden, S., Dolk, J., and Vrijheid, M., 1999. Inequalities in low birth weight: Parental social class, area deprivation, and "lone mother" status. Journal of Epidemiology and Community Health 53, pp. 355-358.
20. Tuntiseranee, P., Olsen, J., Chongsuvivatwong, V., and Limbutara, S., 1999. Socioeconomic and work related determinants of pregnancy outcome in southern Thailand. Journal of Epidemiology and Community Health 53, pp. 624-629.

21. Cramer, J.C., 1995. Racial and ethnic differences in birth weight: The role of income and financial assistance. *Demography* 32, pp. 231–247.
22. DaVanzo, J., Habicht, J.P., and Butz, W.P., 1984. Assessing socioeconomic correlates of birth weight in peninsular Malaysia: ethnic differences and changes over time. *Social Science and Medicine* 18, pp. 387–404.
23. Royal college of obstetricians and Gynaecologists (RCOG), author Clinical guidelines, Antenatal care: Routine care for the healthy pregnant woman. London: RCOG Press; 2003. Retrieved December 27 from http://faculty.ksu.edu.sa/gemeay/my%20lib/Antenatal_Care.pdf
24. UNDP/UNFPA/WHO/World Bank special programme of Research development and Research training in Human Reproduction. Geneva: Department of Reproductive Health and Research, Family and Community Health, World Health Organisation; 2002. WHO Antenatal care randomized trial: Manual for implementation of the new model. Retrieved December, 2, 2012 http://whqlibdoc.who.int/hq/2001/WHO_RHR_01.30.pdf.
25. Yousif E M, Abdul Hafeez A R. The effect of antenatal care on the probability of neonatal survival at birth, Wad Medani Teaching Hospital Sudan. *Sudanese Journal of Public Health*. 2006;1(4):293–297.
26. Beeckman K., Louckx F., Putman K., Determinants of the number of antenatal visits in a metropolitan region *BMC Public Health* 2010, 1-10:527 doi:10.1186/1471-2458-10-527.
27. Petrou S, Kupek E, Vause S, Maresh M: Clinical, provider and sociodemographic determinants of the number of antenatal visits in England and Wales. *SocSci Med* 2001, 52:1123-1134.
28. Hildingsson I, Radestad I, Waldenstrom U: Number of antenatal visits and women's opinion. *ActaObstetGynecolScand* 2005, 84:248-254.

Source Of Financial Support-Nil

Conflict Of Interest-None
