
ORIGINAL COMMUNICATIONS

PRENATAL FACTORS AFFECTING PERINATAL MORTALITY IN BLACKS

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A study of 222 black mothers who gave birth to low-birth-weight infants in a tertiary care center showed that prenatal care plays a significant role in perinatal outcome; the effect of prenatal care was especially dramatic in the infants weighing less than 1,500 grams. In addition, maternal age is an important factor when less than 17 years. When a teenage pregnancy is associated with a lack of, or irregular, prenatal care, fetal outcome is compromised.

In 1980 the District of Columbia had an infant mortality rate of 24.6 per 1,000 live births, the highest rate when compared with 26 major cities in the United States. This figure is twice the national average, which is 12.5 per 1,000 live births.¹ The statistics of 1979 revealed that in the District of Columbia, 94 percent of these infants were black; two thirds of the mortalities occurred in the neonatal period (the first 28 days of life); and 57 percent had birth weight of less than 1,500 grams.² Most neonatal mortality statistics, nationally or locally,

are reported by birth weight.^{2,3} Prenatal factors that affect neonatal mortality, such as adequacy of prenatal care and condition of the mother prior to her entry to the hospital, have not been studied thoroughly. Many researchers have indicated that the factors which cause fetal death are the same factors which contribute to neonatal mortality. Therefore, the main objective of this retrospective study is to review prenatal factors associated with perinatal mortality at Howard University Hospital, a predominately black institution.

METHODS

The data were gathered from the Neonatal Intensive Care Nursery and Labor and Delivery Unit of the Howard University Hospital in Washington, D.C. The Howard University Hospital population consists of over 95 percent blacks, a significant number of whom are indigent. To date, the hospital policy has been to accept any patient having a valid medical diagnosis. Consequently, a large number of patients present themselves for the first time in the labor and delivery unit even though they have had no prenatal care.

Of 1,490 deliveries during 1981, 222 newborns weighed less than 2,500 grams at birth. The following factors were studied: maternal age, birth

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TABLE 1. THE STATUS OF PRENATAL CARE

	Prenatal Care			Total
	Regular	Irregular	None	
Survivors	143	41	7	191
Perinatal mortality	7	16	8	31
Total	150	57	15	222

weight, gestational age, perinatal survival, prenatal care, and the condition of the mother prior to delivery. Maternal age is divided into three groups: under 17 years, 17-19 years, and 20 years or older. The following three categories of prenatal care are identified:

A. *Regular*—If prenatal care is started before the 12th week and continued monthly up to the 28th week; then every 2 weeks up to the 36th week, and weekly thereon.

B. *Irregular*—If prenatal care is started after the 20th week and grossly deviated from the above schedule.

C. *None*—No prenatal care throughout the pregnancy period.

attempted to explain the stark differences between the high and low rates of infant mortality, not only in different countries, but also among different socioeconomic groups within the same society. Factors associated with infant death are often divided into two major groups: *endogenous factors*—all factors related to the health and physiology of the mother which in turn determine the health and physiology of the fetus, and *exogenous or environmental factors*—all factors derived or developed from external causes.⁴ In the case of the socioeconomically disadvantaged mothers who may be suffering from malnutrition, chronic infection, drug addiction, etc, these factors are believed to play a crucial role in determining the chances for survival of a fetus or a newborn.

RESULTS

The basic results relative to these 222 cases are shown in Tables 1, 2, and 3, cross-classified by prenatal care, birth weight, and maternal age, respectively.

DISCUSSION

Infant mortality statistics in general, and neonatal mortality in particular, are excellent indicators of the differences between the health of the rich and of deprived mothers. Many studies have

Prenatal Care and Chance of Survival

It is often hypothesized that prenatal care is strongly associated with neonatal outcome. As it can be noted from Table 1, about 75 percent of all patients whose infants survived the first four weeks of life had regular prenatal care, while only 22.5 percent of the mothers whose babies did not survive had received prenatal care. On the other hand, 3.7 percent of the mothers whose infants survived during the neonatal period, had reported receiving no prenatal care. This compares with more than 25 percent of the mothers whose infants did not survive.

In further examining the relationship between prenatal care and chances for surviving, the chi-

TABLE 2. STATUS OF PRENATAL CARE BY BIRTH WEIGHT

Weight (g)	Survivors			Perinatal Mortality		
	Regular	Irregular	None	Regular	Irregular	None
Under 1,500 g	22	2	1	5	13	7
1,500 g or more	121	38	7	2	3	1
Total	143	40	8	7	16	8

TABLE 3. MATERNAL AGE

	Under 17 Yr	17-19 Yr	20 Yr or Older	Total
Survivors	16	26	149	191
Perinatal Mortality	6	5	20	31
Total	22	31	169	222

square test statistics for the data presented in Table 1 are calculated to be 75.3 which is significant at 0.001 level of significance. The strength of this association, as measured by contingency coefficient (C) is found to be 0.503. This lends support to the hypothesis that there is a strong relationship between prenatal care and the chances of the infant for surviving during the first 28 days of life.

Prenatal Care and Birth Weight

Table 2 shows that of the 25 newborns who survived and weighed less than 1,500 grams, only 4 percent had no prenatal care. The corresponding figure for those who did not survive is 28 percent—about seven times higher. Regular prenatal care occurred in 88 percent of infants under 1,500 g in the survival group and only in 20 percent among the nonsurvivors. This strongly indicates

that the adequacy of prenatal care is vitally important for an infant to survive, especially when a pregnancy may result with a newborn weighing less than 1,500 g.

Maternal Age

With regards to maternal age, the 222 cases were distributed as follows: more than 8 percent of the mothers whose infants survived were under 17 years of age; 13.6 percent, 17 to 19 years; and 78 percent, 20 years or older. The percentages for those whose infants did not survive were 19.4, 16.4, and 64.5 percent, respectively. This shows that the chance of survival is better when the maternal age is greater than 17 years. It must be pointed out that when teenage pregnancy is associated with the lack of, or irregular, prenatal care, fetal outcome is compromised.

TABLE 4. NEONATAL MORTALITY IN LOW BIRTH WEIGHT INFANTS

Case No.	Wt (g)	Age of Mother	Prenatal care	Comments
1	907	14	Irregular	Severe amnionitis, did not reach neonatal ICU
2	765	18	Irregular	—
3	1162	16	None	Prolonged rupture of membrane; maternal sepsis
4	1012	32	Irregular	Heavy smoker; possible drug abuse
5	2296	23	Regular	Multiple birth defects, incompatible with life, lived < 1 hr
6	1389	17	None	Prolonged rupture of membrane; maternal sepsis
7	680	23	Irregular	—
8	1899	15	Irregular (none?)	Hydropes fetalis; possible congenital syphilis
9	624	26	None	IV drug abuser; maternal sepsis
10	1274	16	None	—
11	1617	16	Irregular	Early onset sepsis
12	680	23	Irregular	Possible microcephalic toxoplasmosis?
13	765	32	Irregular	—
14	624	20	Irregular	Abruptio placenta
15	1049	24	Regular	—
16	850	15	None	Heavy smoker; possible drug abuse

Specific Observation on the Condition of the Mother

As Table 4 shows, three out of 16 mothers (18 percent) had a history of drug abuse and 10 out of 191 mothers (5.2 percent) in the survivor group (not shown in Table 4) had history of drug abuse. Acceleration of fetal lung maturation and heroin abuse is well known.⁵ These neonates usually do not die from hyaline membrane disease but from an indirect effect of heroin. Patient 9, a 26-year-old black, female, known IV drug user, with no prenatal care presented to Labor and Delivery with prolonged rupture of the membranes of greater than 72 hours. She was septic and in shock and gave birth to a 624 gram infant. Similarly, patients 4 and 16 smoked heavily and were drug abusers. By looking at Table 4, it can easily be noticed that cases 1, 3, 4, 8, 9, and 16 all had a reasonable chance of survival in a tertiary center like ours if they were not affected by inadequate prenatal care and poor medical condition of the mother prior to their entry into this hospital.

In conclusion, the neonatal survival of an infant weighing less than 2,500 g not only depends on the

care in a tertiary center, but also strongly relates to the adequacy of prenatal care and the condition of the mother prior to the arrival at the hospital.

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