The Relationship of Hematocrit and Incidence of Preterm Birth in an Hispanic Population

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The Relationship of Hematocrit and the Incidence of Preterm Birth in a Hispanic Population

CHAPTER I

Introduction

Preterm birth is one of the most significant health problems in the United States today. In 1986, approximately 357,078 infants were born at less than 37 weeks gestation (U.S. Department of Health and Human Services, 1988), resulting in an increase in infant morbidity and mortality as well as enormous cost in health care dollars. Research has focused on a variety of aspects of preterm birth, including associations with anemia, infection, smoking, young maternal age, minority race, low socioeconomic status, history of previous preterm birth and inadequate prenatal care. Also of interest are the demographics of preterm birth. Do the associations that exist with one population apply to other groups as well. This study will focus upon the relationship of anemia to preterm birth in an Hispanic population.

Preterm birth is a major health care problem in the United States. The World Health Organization defines preterm birth as a gestation less than 37 weeks. In the U.S., preterm births accounts for 9.5% of all births (U.S. Department of Health and Human Services, 1988). The factors associated with preterm birth

are numerous. They include low socioeconomic status (White, Hall, & Campbell, 1986; Meis, Ernest, & Moore, 1987), minority race (Kaltreider & Kohl, 1980), young age (Fedrick & Anderson, 1976; Ryan & Schneider, 1978), previous preterm birth (Donahue & Wan, 1973; Mueller-Heubach & Guzick, 1989), smoking and drug use (Shiono, Klebanoff, & Rhoads, 1986; Meyer & Tonascia, 1977), psychosocial stressors (Newton, Webster, Binu, Maskrey, & Phillips, 1979), uterine and cervical malformations and medical complications (Bobitt, Damato, & Sakakini, 1985; Donahue & Wan, 1973; Hoffman & Bakketeig, 1984; Mueller-Heubach & Guzick, 1989). A low hematocrit has been associated with preterm birth in Caucasian and African-American women in some studies (Donahue & Wan, 1973; Fedrick & Anderson, 1976; Kaltreider & Kohl, 1980; Garn, Ridella, Petzold, & Falkner, 1981; Lieberman, Ryan, Monson, & Schoenbaum, 1989b). However, this relationship has not been studied in Hispanic women.

The Hispanic population is one of the largest minority groups in the United States. The 1980 U.S. Census enumerated 4.6 million persons of Hispanic origin. This figure undoubtedly excludes large numbers of undocumented immigrants (Markides & Coreil, 1986). The term Hispanic refers to ethnicity rather than race. There is much confusion in the literature concerning the proper terminology to apply to this group - "Hispanic", "Chicano",

"Latino", or "Mexican". For purposes of this study, Hispanic will refer to a population of migrant workers primarily of Mexican or Mexican-American origin. Many of these terms reflect a great deal about the political or social consciousness of the persons who identify themselves with the respective categories. The Bureau of Statistics, the Office of Management and Budget, the Bureau of Labor Statistics, and all other federal agencies use the term Hispanic in their data collection and publication activities. For the purposes of this paper, we use the term Hispanic to describe this population. Despite the rapid growth in the number of Hispanics and a growing interest in their health, insufficient research is available regarding many aspects of their health, one of which is the incidence of preterm birth (Markides & Coreil, 1986).

The Hispanic population is a significant minority in the U.S. There were approximately 346,986 births in the United States in 1984 to women of Hispanic origin. These include women of Mexican, Puerto Rican, Cuban, Central and South American origin. Of these births, 9.6% were preterm, resulting in 3,330 premature infants. This preterm birth rate compares to 7.6% for white infants and 16.8% for black infants (Ventura, 1987).

The cost of preterm birth is significant. The human cost is to the health of the infant and to the family who copes with it.

As an infant's birth weight increases from 600 grams to 2500 grams, the neonatal intensive care unit survival rate increases from 10% to 94%. Major handicapping conditions such as cerebral palsy, mental retardation and vision and hearing impairments decrease as a premature infant's birth weight increases. At 1000 grams or less, 30% have a major handicap, while at 1500 to 2500 grams only 10% do (Bennett, 1984).

The taxpayer assumes a significant burden in the care of the preterm infant. It is estimated that 90% of all health care dollars spent on infants are spent on low birth weight infants. Nationally, $1.5 billion per year is spent on low birth weight infants (National Commission to Prevent Infant Mortality, 1988). Therefore, research which identifies factors associated with preterm birth is a critical step in lowering the preterm birth rate. Some data is available but little is known about preterm birth and the Hispanic population.

Review of the Literature

The literature review will concentrate on the following areas relevant to this study. These include the discussion of the incidence of preterm birth as it relates to prenatal hematocrit, age, race, marital status, and socioeconomic status. Characteristics of the Hispanic population in the United States and factors specific to that population will also be presented.

Preterm Birth

Hematocrit/Hemoglobin

The primary variable of interest in this study is anemia. Anemia in pregnancy and its relationship to preterm birth has been explored in a number of studies.

Fedrick and Anderson (1976) studied factors associated with spontaneous preterm birth. During a one week period in 1958, 16,994 women who gave birth in Scotland, England and Wales had a preterm birth rate of 1.67%. Preterm birth was defined as spontaneous labor prior to 37 weeks that resulted in a live or stillborn infant that was less than 2500 grams and did not have any major congenital anomalies or maceration. Twenty-one percent of the women were in lower social classes. Racial differences were not delineated by the authors. They did not find any evidence to suggest that a low hematocrit/hemoglobin level in pregnancy was associated with preterm birth in this population in the British Isles.

Klebanoff, Shiono, Berendes and Rhoads (1989) studied the hematocrit of women delivering preterm or term and found that hematocrit rises throughout the third trimester in normal pregnancy, resulting in a spuriously positive association between anemia and preterm labor. These authors do state the mean hematocrit failed to rise during the third trimester among women

who did not receive iron supplements, thus casting doubt on the theory that the relationship of hematocrit to preterm birth is a spurious reflection of a naturally occurring phenomena.

In 1973, Donahue and Wan tested the relationship of nine independent variables to the dependent variable, prematurity, in a sample of 1,142 live births. The sample was randomly chosen from all live births in Rhode Island in 1965 and 1966. The minority population for the state was 2.1%. In the study sample 5% of the live births were to minority women. The nine independent variables were parity, age, outcome of previous pregnancies, previous low birth weight infant, serious or minor medical complications of previous pregnancies, serious or minor obstetrical complications of previous pregnancies and low hemoglobin. Hemoglobin values were subclassed into less than or equal to 8.9 grams, 9.0-11.9 grams and greater than or equal to 12 grams. Each factor was analyzed by binary multiple regression and was weighted in accordance with the strength of the association with a premature infant. Individual risk scores for each variable were added for a Total Risk Score for a particular woman. High Total Risk Scores were associated with high rates of prematurity and neonatal death rates. Of the nine factors, hemoglobin and previous low birth weight infant were weighted the highest, with a weighting factor of 18.38. In comparison, age had the lowest

weighting factor, .74.

Limitations to this study include lack of clarity in the timing of hemoglobin determination and in the measurement of preterm birth. There is some indication that preterm birth was defined by birth weight, clearly an inadequate measure. Furthermore, only three of the nine measures used in the study could be applied to the primigravida.

Kaltreider and Kohl (1980) defined preterm birth by using both birth weight and gestational age to differentiate accurately prematurity factors from growth retardation factors. In a sample of 240,474 they found increased rates of preterm birth when hemoglobin levels were below 11g/100ml. For instance, a greater than 200% rate of increase of preterm birth with a hemoglobin less than 8g could be expected. The timing of the hematocrit levels was not specified.

Lieberman, Ryan, Monson and Schoenbaum (1989b) studied the relationship between hematocrit and prematurity in a population of 12,718 Bostonian women. In this sample of both African-American and caucasian women, 384 (4.9%) women gave birth before 37 weeks gestation while 7779 women gave birth at or beyond 37 weeks. This lower than national preterm birth rate may be attributed to the women who were excluded which includes women who had vaginal bleeding during the second or third trimester, who had their

pregnancy artificially interrupted (usually by induction of labor or cesarean section), who were not African-American or caucasian (due to few numbers in other ethnic groups), and who had uncertain insurance status (because insurance status was the criteria for socioeconomic status). Among the final sample of 8,163 women, the prematurity rate was 4.7%.

Hematocrit was subclassed into less than 30%, 31-34%, 35-40%, 41-44% and 45-49% and was obtained in the hospital upon admission to labor and delivery. Analyses that were performed are the following: 1) logistic regression analysis to determine hematocrit as a predictor of preterm birth, 2) logistic regression to determine the role of hematocrit in selected high risk groups, and 3) logistic regression with multiple confounding variables controlled to investigate hematocrit's association to preterm birth. When hematocrit was 41-44%, preterm birth rates were lowest. Hematocrits of 30% or less were associated with the highest preterm birth rates. Also of note is the significantly increased risk of preterm birth with each level of hematocrit of 40% or less. Women with hematocrits as high as 37% were twice as likely to have a preterm infant as women with a hematocrit between 41-44%. This ratio increased as hematocrit decreased. The increased risk of preterm birth with hematocrits less than 40% is interesting as health care providers generally consider

hematocrits of 34-40% adequate in pregnancy. The timing of the measurement of hematocrit, however raises the question of the skewing of results by a natural increase in hematocrit during the third trimester as noted by Klebanoff et al, 1989. If the hematocrit does rise during the third trimester, one would expect higher hematocrit on admission to labor and delivery at term.

From the previously described studies, there is conflicting evidence to support the association of a low maternal hematocrit and preterm birth. However, the strongest evidence supports a relationship between a lower hematocrit and the incidence of preterm birth. Many studies have been done in African-American and Caucasian populations, but no studies were found among the Hispanic population.

Other Variables

The other variables that will be addressed and are associated with preterm birth are age, race\ethnicity marital status and socioeconomic status. Each of these variables has served as a focus for study in relation to preterm birth.

Age

Maternal age has been associated with preterm birth. Very young (less than 20) as well as older women (35 or greater) are reported to have an increased incidence of preterm birth with neonatal death. Donahue and Wan (1973) used data from 1965 and

1966 of 1,142 live births and 574 neonatal deaths in Rhode Island to develop a risk scoring system to predict preterm birth and neonatal death rates. Nine independent variables were analyzed by binary variable regression for their predictive value. Age was subclassed into less than 20, 20-24, 25-29, 30-34 and greater than 35. Of the nine variables, maternal age had the lowest risk score. However, the researchers found that age less than 20 and greater than 35 slightly increased a woman's risk for preterm birth and neonatal death. A limitation of the risk scoring system used was its lack of utility in prediction for nulliparous women. Only three of the nine variables were used to predict preterm births for nulliparous women, namely age, gravidity and hemoglobin. The other six variables applied to previous pregnancies. Another limitation is that the authors main focus was to prevent neonatal death by identifying women at risk for preterm birth and the sequela of neonatal death. Thus, preterm birth was analyzed for its relationship to neonatal death. This excluded a number of infants who were born preterm but survived.

In 1976, Fedrick and Anderson presented their research from 16,994 births, during a week period in 1958 in Scotland, England and Wales. Preterm birth was defined as spontaneous labor prior to 37 weeks gestation that resulted in a live or stillborn infant less than 2500 grams without a major congenital defect or

maceration. Of the sample, 283 (1.67%) infants were born preterm. As maternal age decreased, preterm birth rates increased. The authors did not state if this was a significant increase in the incidence of preterm birth. The highest preterm birth rate, 2.15%, occurred for women less than 20. In comparison, women 35 to 39 years old had a preterm birth rate of 1.43%. In contrast to Donahue and Wan (1973), maternal age greater than 35 had the lowest preterm birth rate.

Ryan and Schneider (1978) studied complications of teenage pregnancies in a sample of adolescents who gave birth at a public facility in Tennessee (N=222). A 12% rate of preterm birth was found among these adolescents. The majority of these young women were African-American (89%), indigent (stated by the authors), and single (81%). Almost half received no or very little prenatal care. Although the preterm birth rate was twice that of the general population, as stated by the authors, preterm birth was defined by birth weight. It is not clear what general population the authors compared to the adolescent group. Use of birth weight alone would result in an over estimation by including term low birth weight babies as well as those less than 37 weeks gestation.

Kaltreider and Kohl (1980) used the Obstetrical Statistical Cooperative computer bank and collected data from 1970 to 1976. The sample included 140,656 white subjects and 99,738 women of

color. The authors divided the births into term-low birth weight (T-LBW) and preterm-low birth weight (P-LBW). The women most at risk to have a P-LBW were adolescents younger than 15 years in both of the caucasian and minority groups. Mothers less than 15 had three times the rate of preterm birth when compared to mothers 20 -29 years. Women 16 to 19 years old had a one and a half times increased risk of P-LBW.

Hoffman and Bakketeig (1984) studied the demographics of preterm birth using data collected from birth certificates over a ten year period in Norway and a two year period in Minnesota. The Norwegian sample included 138,494 singleton births and the Minnesotan sample was unspecified. The preterm birth rate was 6.1% for the Minnesotan sample and 3.7% for the Norwegian sample. Maternal age less than 20 (9.3%) and primigravidas older than 30 (7.2%) were at an increased risk for preterm birth. The highest preterm birth rate (21.3%) was associated with women less than 20 years old who were having their third child.

White, Hall and Campbell (1986) compared premature rupture of membranes (PROM) and premature onset of contractions (POOC) with intact membranes. Their study included 254 primigravidas with singleton births between 28-36 gestational weeks and all primigravidas that delivered at term at Aberdeen City District. These data were collected in England from 1978 to 1982. Mothers

less than 20 were significantly more likely to experience both PROM and POOC than older mothers. However, for women with both premature onset of contractions and premature rupture of membranes, maternal age was not significant. The authors speculate that there are different mechanisms for premature onset of contractions and premature rupture of membranes and that they need to be delineated in research and practice.

Berkowitz (1981) studied a sample of 488 women from at Yale-New Haven Hospital. The sample included 175 women who bore preterm infants and 313 who bore term infants. Preterm birth was defined as gestational age less than 37 weeks. The average gestational age for the control groups was 38.8 weeks and 34.1 weeks for the experimental group. Although younger mothers did have a higher preterm birth rate, when socioeconomic status was controlled, age was not a predictor of preterm birth.

Dougherty and Jones (1988) found that younger mothers (18 to 20 years old) had a higher preterm birth rate. Their sample included 1,072 births to primiparous mothers in London. To determine the effect of individual risk factors, they used logit analysis, a maximum likelihood technique which permits the measurement of variations in the probability of an event occurring according to maternal characteristics. Among the limitations noted, socioeconomic status was measured by the number of rooms in

a woman's home. However, this factor was discarded as inadequate. Furthermore, comparison with other research is difficult as preterm birth was defined as less than 38 rather than 37 weeks gestation and women younger than 18 were excluded.

Mueller-Heubach and Guzick (1989) studied an indigent population using a tool developed in New Zealand to predict preterm birth. Over a three year period, 4,591 women in Pittsburgh were studied. The preterm birth rate in this sample was 8 percent. Of 44 original risk factors, 25 were found not predictive of preterm birth. Of the remaining 19, only five had a positive predictive value and maternal age was not among them. The researchers do state that predictive factors for the primigravida are limited. Only three of the five risk factors found predictive applied to primigravid women; prepregnancy weight less than 45.5 kilograms, African-American race and single marital status.

Although some studies indicate that adolescent women and women over 30 are at increased risk for a preterm birth, the research is inconclusive. Results are often confounded by differing definitions of preterm birth and by lack of control of other variables such as socioeconomic status. In practice, however, very young women and women 35 or older are generally considered at risk for preterm birth.

Race\Ethnicity

A woman's race/ethnicity has also been associated with preterm birth. Women of color are often reported to have an increased incidence of preterm birth. In a sample of 240,474, Kaltreider and Kohl (1980) found that the preterm birth rate for women of color was 7% compared to 3.4% for caucasian women. In a sample of 110,500, Hoffman and Bakketeig (1984) noted that women of color, on the average, gave birth one week earlier than caucasian women. For each week of gestation, minority preterm birth rates were double that of caucasian rates. Dougherty and Jones (1988) concluded that women of color had a significantly increased risk of giving birth prior to 38 weeks. Mueller-Heubach and Guzick (1989) controlled for a number of variables in an indigent population and concluded that African-American, multiparous women had an increased risk for preterm birth. Race was not a statistically significant risk factor for the primigravida. Shiono and Klebanoff reported in 1986 in their study that even after accounting for all confounding medical, social, and demographic influences, African-American women have a persistently higher risk of delivering preterm.

Other studies have not confirmed a relationship between preterm birth and race. Lieberman, Ryan, Monson and Schoebaum (1989a) studied 8,903 women, both African-American and caucasian.

They did cite an increased preterm birth rate for African-American women. However, when four sociocultural factors (age less than 20, single marital status, welfare recipient and not having graduated from high school) and low hematocrit were controlled, race was not a predictor of preterm birth.

The studies that report race as a significant risk factor for preterm birth frequently share certain limitations. For instance, data such as socioeconomic status or psychosocial stressors are usually not controlled. Another weakness in most studies is that race is defined as caucasian and noncaucasian. Clarification is needed to identify what minorities are represented.

Marital Status

Single women are reported to have higher rates of preterm birth than married women. Kaltreider and Kohl (1980) reported a 90% greater risk of preterm birth for caucasian, single women compared to caucasian, married women. However, this relationship was not evident in a minority population. No explanation was offered by the researchers. However, cultural differences in the significance of unwed motherhood may contribute to differences in social support or other factors that may influence preterm birth. White, Hall and Campbell (1986) studied 254 primiparous women with intact membranes that had experienced premature labor. After a

retrospective record review was conducted, the authors found a higher proportion of single women who experienced a preterm birth than married women. This suggests that either single women are in some way predisposed to preterm uterine contractions or that an unknown factor is involved which is more common in pregnancy in single women, such as differences in life-style or social support.

In 1989, Mueller-Heubach and Guzick used multiple regression to find the most significant of 44 risk factors associated with preterm birth. One of the five most significant was marital status. In a sample of 3072 single women the authors found an 8.8% preterm birth rate compared to a 6.2% preterm birth rate for the married women. These authors sought to analyze racial differences in risk factors by taking into consideration the much higher preterm delivery rate of African-American women. They found being single to be an independent predictor of preterm birth.

Studies that dispute these findings have controlled for socioeconomic status. Berkowitz (1981) concluded that marital status was not a significant predictor of preterm birth if socioeconomic status was controlled. Golding, Robinson, Henriques and Thomas (1987) compared women who conceived before marriage to those who conceived after marriage. Preterm birth was defined as less than 37 weeks gestation and was based on last menstrual

period. Multiple regression was used to analyze such variables as maternal age, parity and smoking. They concluded that singleness at the time of conception only slightly increased preterm birth rates.

Socioeconomic Status

A fourth factor that has been associated with preterm birth is low socioeconomic status. Low socioeconomic status has been defined in a variety of ways; a welfare recipient, class IV or V (English) and public clients.

In 1976, Fedrick and Anderson presented their research from 16,994 births, during a week period in 1958 in Scotland, England and Wales. Preterm birth was defined as spontaneous labor prior to 37 weeks gestation that resulted in a live or stillborn infant less than 2500 grams without a major congenital defect or maceration. Women were divided into five social classes based on their or their husbands occupation. Class I being the highest and class V being the lowest. Women in the IV and V class had a 50% increase in the incidence of preterm birth when compared to women in the I and II class.

Kaltreider and Kohl (1980) used the Obstetrical Statistical Cooperative computer bank and collected data from 1970 to 1976. The sample included 140,656 white subjects and 99,738 women of color. The authors divided the births into term-low birth weight

(T-LBW) and preterm-low birth weight (P-LBW). Each woman's socioeconomic status was based on whether she was a private or ward client. Ward clients had a 67-84% increase in P-LBW compared to private clients.

Berkowitz (1981) studied a sample of 488 women at Yale-New Haven Hospital. The sample included 175 women who bore preterm infants and 313 who bore term infants. Preterm birth was defined as gestational age less than 37 weeks. The average gestational age for the control groups was 38.8 weeks and 34.1 weeks for the experimental group. Socioeconomic status was divided into five categories, upper, upper middle, middle, lower middle and lower. The authors do not state the criteria for the categories. Women in the lower category had a significantly increased risk of preterm birth.

In 1983, Carson reviewed relevant literature and found a consistent relationship between low socioeconomic status and preterm birth. In a sample of 240,474 women, 2.5% of private clients and 4.6% of ward clients had preterm births.

White, Hall and Campbell (1986) grouped English women into classes I, II, III, IV and V. Social class was based on the profession of either the woman or her husband. Class I was the highest, both economically and educationally. There was no statistically significant difference between social classes for

either premature rupture of membranes or premature onset of contractions. However, the majority of unclassified women (those not placed in a numbered category) were single and in the lower classes, and also had a higher incidence of preterm birth. The authors stated that if the unclassified women were placed into class IV or V and their preterm rates were analyzed, an increased risk factor may have been seen.

Meis, Ernest and Moore (1987) compared the causes of low birth weight infants in public and private clients in North Carolina. Data were collected in 1983 and 1984 and included 1529 public and 1327 private clients. They found that 24.8% of low birth weight (LBW) infants in public clients were attributed to premature labor while 33% of preterm birth was attributed to premature rupture of membranes. In comparison, 47.1% of private clients' LBW infants were related to premature labor and only 23% of preterm births were attributed to premature rupture of the membranes. The authors concluded that prematurity prevention programs need to be tailored to the clientele involved. Public clients need a prevention program that addresses premature rupture of membranes and private clients need a program that addresses premature onset of contractions.

Research to date indicates that lower socioeconomic status increases preterm birth rates. However, a more consistent measure

of socioeconomic status is needed as well as delineation of levels of low socioeconomic status. Other factors associated with low socioeconomic status such as poor nutrition, decreased social support and increased stress need to be included in this research.

The research on the relationship of the incidence of preterm birth with hematocrit, age, marital and socioeconomic status is inconclusive. Least convincing is the association between marital status and preterm birth. Often other factors are not controlled and some studies showed no association. The relationship of age and preterm birth is somewhat more persuasive. However, although some studies reported an association, several of them found no relationship between age and preterm birth. More research is needed to clarify the relationship. Socioeconomic status and preterm birth had the strongest association. Studies consistently report that women in low socioeconomic groups have higher rates of preterm birth.

Hispanic Population in the U.S. and Oregon

The Hispanic population of the United States is reported to be the sixth largest in the world (Trevino, 1982). Hispanics constitute the largest ethnic minority in the Southwest U.S. The term Hispanic refers to ethnicity rather than race. In the United States, Hispanics may be of Mexican, Puerto Rican, Cuban, Spanish or other geographic origin. They choose to identify themselves

ethnically as Hispanic, while racially they may be classified as White, Black, American Indian or Eskimo (Trevino, 1982). The Hispanic population represents, from a number of perspectives, a group that is culturally, historically and demographically unique. It is a heterogenous population which possesses in varying degrees a number of characteristics that are commonly identified with minority group status. These include limited economic and political power, distinguishing physical features, low social status and a distinctive life-style (Anderson, Lewis, Giachello, Aday, & Chiu, 1981).

It is important to remember when reviewing or conducting research about Hispanics in the United States to be aware of the predominant subgroup being studied (Trevino, 1982). Hispanic may not be the perfect unifying term but it is has generated widespread acceptance among Hispanics and non-Hispanics and in the scientific literature as well as the news media in only 7 or 8 years (Trevino, 1987).

Large gaps remain in the understanding of the health status of this group. Hispanic populations have been found to receive far less preventive care. They make physician and dental visits less frequently than the U.S. population as a whole (Perez, 1983). Potential reasons for underutilization of services include economic barriers, cultural barriers such as the use of folk

medicine, and system barriers. The most obvious barriers to health care are language and undocumented immigration status. Also, Hispanics are less likely to have health insurance coverage than other Americans, largely as a result of their employment in jobs that do not provide such coverage (Anderson et al, 1981).

Preterm Birth among Hispanics in the United States

Little research has been done concerning preterm birth among Hispanics in the U.S. In 1986, Williams, Binkin and Clingman noted while studying 414,538 singleton live births in California during 1981, that Latino (Hispanic) women had a lower frequency of low weight births compared to other ethnic minorities. It is suggested by Williams et al. that this may be due to better nutrition, lower rates of smoking and alcohol consumption, or a higher regard for parental roles.

The main focus of this study is the association between hematocrit and preterm birth in an Hispanic population. Studies reporting the association between a low maternal hematocrit and preterm birth are inconclusive and conflicting, but indicate the possibility of a relationship in caucasian and black women. No data is available among Hispanics. Further research in these areas may help to clarify and better predict preterm birth in this population.

Conceptual Framework

The conceptual framework for this study postulates the two possible effects of a low hematocrit and its relationship to preterm labor (See Figure 1).

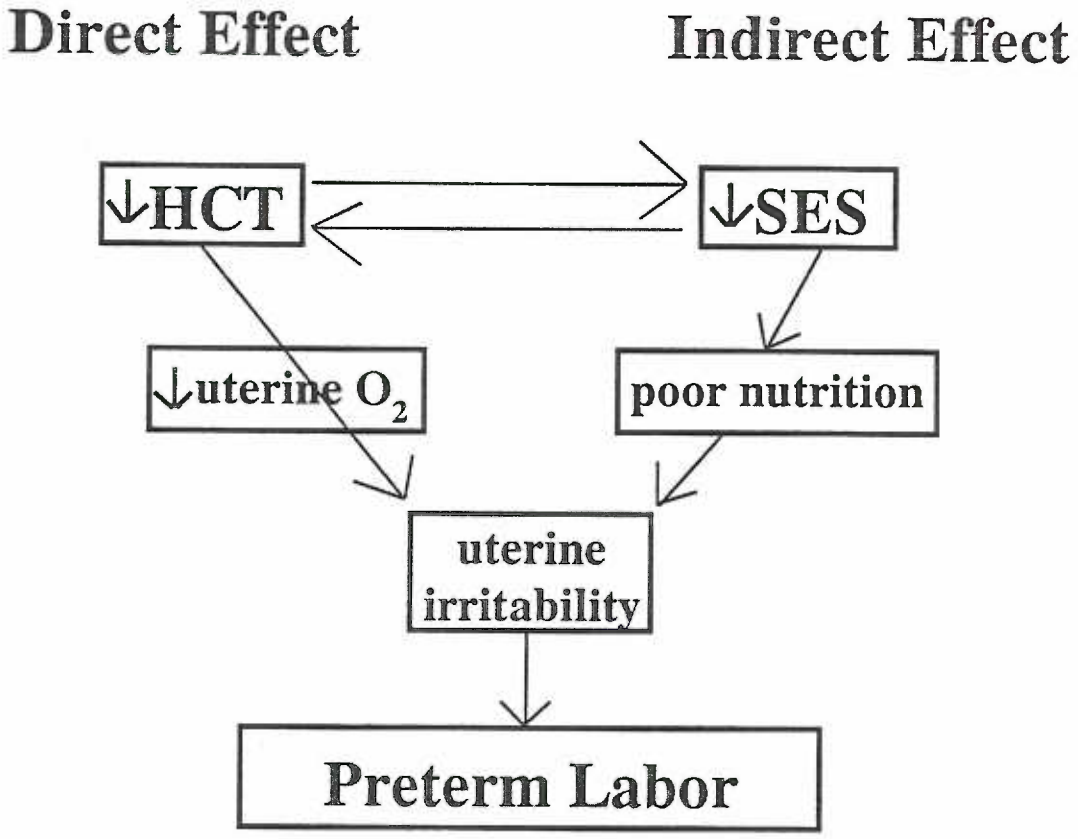

Figure 1. Two possible effects of a low hematocrit.

The direct effect of a low hematocrit on preterm labor may be the diminished efficiency of the red blood cells in the transport of oxygen and carbon dioxide and nutrients to the uterus (Garn, Ridella, Petzold, & Falkner, 1981). The uterus is the focal point of increased blood flow during pregnancy to meet the needs of the developing fetus and the increased oxygen requirements needed by the mother for labor. Possibly, this decreased efficiency of the red blood cells has a direct effect on uterine contractility, thereby making the uterus more susceptible to preterm labor.

An indirect effect of a low hematocrit and its relationship to preterm labor would suggest poor nutrition, iron deficiency, folate deficiency, and recurrent infections in the pregnant patient. A low hematocrit is one objective measure of poor nutrition in a low socioeconomic group who is already at increased risk for preterm labor. The combination of iron deficiency and folic acid deficiency is likely to be seen in patients of low socioeconomic status, who have not had prenatal care, who have poor dietary habits, and who have repeated pregnancies (Messer,1974).

Statement of the Problem

The purpose of this research was to compare initial hematocrit with the incidence of preterm birth among Hispanic

women.

Research Question

The following research question was studied: What relationship exists between initial hematocrit and preterm birth in a Hispanic population?

CHAPTER II

Methods

Design

This research used a descriptive correlational design to explore the relationship between the variables of initial hematocrit, age, marital status and socioeconomic status with the incidence of preterm birth. This study consisted of a secondary analysis of data from the following described data set.

Sample and Setting

The sample for this research consisted of Hispanic women who received prenatal care at a federally funded clinic for migrant workers with care provided by nurse-midwives. The data set included Hispanic women who received care during the years 1985 to 1989. The sample included those women who were of Hispanic ethnic background, who had an initial recorded hematocrit and who delivered beyond twenty weeks gestation. A sample of 350 women was analyzed.

Variables

The initial hematocrit obtained at the first prenatal visit was the independent variable in this study. The demographic variables of age, race, marital status, and socioeconomic status

were considered as additional variables. The dependent variable in this study was preterm birth.

Hematocrit

Previous studies have used the lowest hematocrit obtained during pregnancy or the hematocrit obtained immediately prior to the birth. However, in this sample the average initial prenatal visit occurred late in the second trimester, close enough to preterm viability to serve as a predictor of risk status for preterm birth. These hematocrits were drawn in the clinic and sent to a local laboratory for Coulter analysis. Hematocrits were categorized as less than or equal to 30%, 30.1-32%, 32.1-34%, 34.1-36% and greater than or equal to 36.1% in the 1985-1988 data set. In the 1989 data set, categorized data and actual numbers were entered.

Other Variables

Age

Age was categorized as less than 10-14, 15-19, 20-34 and 35-44. The new data (1989) was entered as a category and also as an actual age.

Marital Status

Marital status was indicated by a woman by self-report on the first prenatal visit. It was recorded as married, divorced, widowed, separated, "living with" and single.

Socioeconomic Status

Socioeconomic status was defined by how much a woman and her family paid for prenatal care. The categories were payment of 0%, 25%, 50%, 75%, and 100% of cost, Medicaid and private insurance.

Preterm Birth

Preterm birth was defined 20 to 37 weeks gestation. This was based on last menstrual period, a rare ultrasound or neonatal gestational assessment.

Data Collection and Procedure

The following procedure was used.

1. Both researchers were oriented to the Prenatal Statistic Forms dating from 1985 to 1988 by personnel at the maternity services clinic. Data from 1985 to 1988 had previously been stored in the computer. Data from 1989 were entered into the current data set.
2. If information was missing from the Prenatal Statistic Form, women were identified by chart numbers and missing data from the charts at the clinic were obtained.
3. Women who gave birth prematurely in 1989 were identified in a log book kept at the clinic.
4. At the end of the data collection period, analysis of the data was done using the CRUNCH statistical package.

Analysis

Independent correlations (Pearson's r and chi square) were

done on the data set to understand the effects of the multiple variables on the dependent measure, preterm birth. In addition to the correlation of the previously identified variables for the entire data set, an analysis was done for 13 variables between all women with preterm birth and a matched control. The groups were matched on the variables of a categorized initial hematocrit, an actual number of the initial hematocrit, the woman's gravidity, pre-eclampsia and eclampsia, gestational diabetes, multiple gestation, syphilis, pyelonephritis, urinary tract infections (both symptomatic and asymptomatic), other types of infections, and prenatal visits. Preterm and term women were then matched for age, previous preterm birth and weeks gestation at first visit by identifying everyone who matched on those criteria. If there was more than one, than the one selected match was randomly chosen using the random numbers table. Paired t-tests were done using the thirteen variables of these two groups.

CHAPTER III

Results and Discussion

The results of the study are presented in six sections. First, the sample is described. Second, the incidence of preterm birth and hematocrit levels are described. Third, the measures of the relationships between preterm birth and hematocrit are discussed. Also discussed in this section are the measures of the relationships between preterm birth and selected demographic variables. Fourth, the measures of differences between the preterm birth group and the matched term group are discussed. Finally, a summary and discussion of the results are presented.

Description of the Sample

There were 354 Hispanics who received care at the clinic from 1985-1988 and were included in the data set. In addition, 240 Hispanic women were entered for 1989. The total sample was 594 Hispanic women. Of these, 77 women had missing data on gestational age at birth. Therefore the final sample was 517 women.

Sixty-five percent of the sample was 20 to 34 years of age. For the 240 in 1989 who had age entered as an actual number, the mean was 23.3 (SD=5.9). An impressive number of women (30%) were

19 years or younger.

Most of the women were married (72%) or living with a partner (15%). The 27% of women who were not married where either living with a partner (15%), single (11%), separated (1%) or widowed (.17%). Nationally, 26% of Hispanic women and 21% of non-Hispanic women who gave birth from June, 1987 to June, 1988 were not married (U.S. Bureau of the Census, 1988). In Oregon, 27.3% of Hispanic women and 23.5% of all women who gave birth in 1988 were not married (Oregon Department of Human Resources, 1989).

A total of 29% of the sample had a payment status that required 25% of cost. For a family of four, this represents a yearly income of $12,701-14,840. The 58% of the sample which was in the 0% payment category had an annual income of less than $12,701 for a family of four. The income level of this sample was far below the median national income for Hispanics, which is $20,300 (U.S. Bureau of the Census, 1988). Nationally, 25.8% of Hispanic people are below the federal poverty level which is $12,700 for a family of four (U.S. Bureau of the Census, 1988). 12% of the sample had a payment status that required 50% of cost. No one in the sample utilized Medicaid or private insurance for payment.

Preterm Birth

The incidence of preterm birth for the sample was 4.45% For

the group of women who received care in 1989, the incidence was 4.98%. Compared nationally to Hispanic women who have a 9.6% preterm birth rate, these figures are almost half. There are a number of factors that might have contributed to the lower rate in this sample. First poor dating is a problem in this sample. Because of late entry into care, few first trimester exams were done, and confirmation with ultrasound was rare. If a woman gave birth prior to 37 weeks and the infant appeared healthy, often gestational age was not documented on the chart or data sheet. After 1987, the certified nurse-midwives who serve as the primary care providers stopped intrapartum care and therefore did not have easy access to the woman or infant's hospital record. If the hospital or the woman told the clinic that she had delivered prematurely, then the information was recorded in the log book at the clinic.

Hematocrit

The mode for initial hematocrit was greater than or equal to 36.1%. The percent of hematocrit less than or equal to 34% was 28%. For the women in 1989 who had their actual hematocrit entered, the mean was 37.0 (sd=3.5). Compared to other studies, Lieberman, E., et al, and Klebanoff, M., et al, this shows a higher level of hematocrits than other samples.

The mode for gestational week at first visit was 13-20

weeks. However, 42% of the sample began care greater than or equal to 21 weeks. For the women in 1989, the mean was 19.7 (sd=9) weeks.

Measures of Relationships

Preterm Birth and Hematocrit

The primary question in this study focused on the relationship between initial hematocrit and preterm birth in a Hispanic community. Pearson's r analysis was used to examine the relationship between hematocrit and term versus preterm birth. No significant relationship was found for the sample ($r=.0721$, $p<.0600$). However, when the actual hematocrit was analyzed, a low but significant relationship was also found ($r=.1388$, $p<.0212$).

Preterm Birth and Other Variables

Pearson's r was used to analyze the relationship of age with the incidence of preterm birth. Chi square was used to analyze the relationship of marital status and preterm birth. Payment status did not have enough variance to analyze, as 90% of the women were 0 to 25% of payment. No significance was found for age ($r=.0414$, $p<.1738$) or marital status (chi square=.4978, $df=4$, $p<.9737$). When age was analyzed as an actual number for the women in 1989, no significance was found ($r=.0311$, $p<.31$).

Measures of Differences

When the preterm birth group was matched with a term group

using paired t-tests for 13 different variables only the number of prenatal visits was significant ($t= -2.11$, $df= 27.74$, $p<0.0443$). The other 12 variables matched with the preterm group and the term group were the following: A categorized initial hematocrit, an actual number of the initial hematocrit, the woman's gravidity, preeclampsia and eclampsia, gestational diabetes, multiple gestation, syphilis, pyelonephritis, urinary tract infections (both symptomatic and asymptomatic) and other types of infections. No significance was found for any of these variables upon completing paired t-tests.

The preterm birth group had a mean number of visits of 6.15 and the term group had a mean number of visits of 9.05. This difference probably reflects the occurrence of a preterm delivery itself as most prenatal visits occur in the third trimester.

Summary of Results

In a sample of 517 Hispanic women seen at a migrant clinic, who were mostly between the ages of 20 and 34, married, and poor, there is evidence of a low rate of preterm birth (4.45%) compared to the national rate of preterm birth among Hispanics (9.6%). Among these births, no significant relationship was found between a low hematocrit and the incidence of preterm birth. However, in 1989, there was a low but significant relationship between a low hematocrit and the incidence of preterm birth when the actual

numbers were entered into the data set. No significant relationship was found between age, marital status, or payment status and the incidence of preterm birth. When matched with a term control group, only the number of prenatal visits discriminated between the term and the preterm group. These results suggest that although no significant findings were obtained in the analysis of this data, one observation did become apparent to the researchers. This particular Hispanic population has a much lower incidence of preterm birth than the general Hispanic population.

Discussion

It is possible there was some significance in the relationship between a low hematocrit and preterm birth in the earlier years of data collection (1985-1988), but because of the methods of record-keeping in which data was categorized relationships were obscured. From the 1989 data in which improved record-keeping occurred, there was a low but significant relationship between a low hematocrit and preterm birth.

The timing of the measurement of hematocrit needs to be closely monitored when conducting or evaluating research. Previous studies have used the lowest hematocrit obtained during pregnancy or the hematocrit obtained immediately prior to birth. Some studies, for instance Kaltreider and Kohl's in 1980, did not

even state when the hematocrit was obtained. In this sample, the hematocrit obtained at the first prenatal visit, which usually occurred late in the second trimester, was used. It is close enough to preterm viability to serve as a predictor of risk status for preterm birth. When the actual number of the hematocrit was entered in the 1989 data set, there was a significant relationship between a low hematocrit and the incidence of preterm birth.

The small sample size of this study may have contributed to the lack of a significant relationship between a low hematocrit and the incidence of preterm birth. Lieberman, Ryan, Monson and Schoenbaum (1989b) studied a sample size of 12,718 women and found a positive relationship between a low hematocrit and preterm birth in African-American and caucasian women. Kaltreider and Kohl (1980) also studied a very large sample of 240,474 women and found a positive relationship between these two variables. Most patients in the large studies that found a positive relationship also were of lower socioeconomic status. Possibly this may reflect the indirect effect of nutrition which may result in a lower hematocrit. No studies were found which tested this relationship in Hispanic women.

No significant relationships were found between age, marital status and preterm birth. Since 87% of the women were partnered (either living with or married) possibly there is too

little variance to analyze and determine the existence of any relationship between a low hematocrit and preterm birth. Since other studies have found a relationship, perhaps one reason this sample had such a low preterm birth rate is the fact that so many are partnered.

The socioeconomic status of this population did not vary. Most were poor and therefore paid minimally for services. This makes one wonder if finances deterred the women from seeking care early. Most women began care in the second trimester of pregnancy. Another reason for late care might be if culturally the women did not feel or understand the need to be seen early in pregnancy.

CHAPTER IV

Summary

The purpose of this study was to examine the relationship between a low hematocrit and the incidence of preterm birth. Selected variables which have been associated with preterm birth in the general population and their relationship with preterm birth among Hispanics were explored. The literature reports conflicting relationships between hematocrit and preterm birth in the general population and no literature was found which studied this relationship in the Hispanic population. Therefore, a descriptive design was used to evaluate the relationship between hematocrit and preterm birth.

The study was performed using existing data from a migrant health clinic in rural Oregon. The sample consisted of 517 Hispanic women delivering a baby from 1985 through 1989 with the nurse-midwifery service of the clinic.

No significant relationships were found between a low hematocrit and the incidence of preterm birth in the total sample, but there was a low, but significant relationship in the 1989 data set possibly because of improved record-keeping. Pearsons r analysis revealed no significant relationships between preterm

birth and the other variables thought to be associated with it; age and marital status. Through independent t-tests the preterm group's only significant finding was the number of prenatal visits when matched with a term group of women.

These results suggest that these may be a possible relationship between a low hematocrit and incidence of preterm birth among Hispanic women. This is especially evident in the 1989 data set in which the actual number of the initial hematocrit was entered. Because of the uniformly low socioeconomic status of the sample, it is impossible to speculate whether the relationship between hematocrit and preterm birth is a direct effect or an indirect marker of the increased risk of poverty and its attendant social correlates (unwed status, poor nutrition, minority status, and so forth). The postulated theoretical relationships cannot be supported in this research but may still be valid.

Limitations

The greatest limitation of this study was the data collection tool used by the nurse midwives at the clinic. The use of categorical data rather than interval data seriously restricted its interpretation. The missing information from the data sheets also severely limited the ability of this data to show significant relationships. For 1987 and 1988 it was unclear whether all women with preterm births were entered into the previously collected

data set. This would obviously alter the findings of this study.

Another limitation is the sample itself. The sample was primarily migrant agricultural workers whose socioeconomic status for the most part did not vary. This limits the generalizability of the findings to other populations. Also, there was a very small number of women (23) who experienced a preterm birth in the total sample. This severely limits the confidence one can place on the findings.

Another limitation is that certified nurse-midwives stopped providing intrapartal services to these women in 1987, therefore record-keeping also ceased in the intrapartum period. Valuable data was lost to the study and follow-up retrieval was virtually impossible.

Recommendations for Future Research

In order to better determine the relationship between a low hematocrit and preterm birth in a Hispanic population, the above limitations need to be addressed. Future research should investigate the values of hematocrits at 20 weeks, 28 weeks, and just prior to delivery to better assess their relationship to preterm birth. Accurate record-keeping should be standardized and maintained for accurate findings in future research. Cultural factors such as, social support and dietary habits, which may influence preterm birth need to be explored further. Qualitative

studies may be necessary to identify those factors.

Further, future research might ask what these poor Hispanic women are doing so well to have such a low preterm birth rate. What factors contribute to this? Could it be the cultural support of a rural Hispanic population? Could it be the nurse-midwifery clinic itself providing excellent prenatal care and thereby improving perinatal outcomes? Further study of this particular population may possibly answer these questions.

A larger sample size is necessary to analyze a greater number of preterm births for statistical purposes. A sample that is more representative of the general Hispanic population would give results that are more generalizable. The study of migrant versus resident Hispanics and rural versus urban Hispanics may yield a difference in the preterm birth rate. The components of nurse-midwifery prenatal care should be compared to physician provided prenatal care to identify differences which might have an influence on the incidence of preterm birth. Finally, it may be questioned whether the needs of these Hispanic women are met by traditional prenatal care.

Nursing Relevance

The significance of this study for nursing is rooted in the concept of providing culturally sensitive nursing care. As the Hispanic population of the United States increases, nurses must

meet the challenges of providing quality care specific to the needs of this population.

It is remarkable that so little research has been done on Hispanics and their reproductive health care needs, especially since this population is steadily growing in the United States. This study sought to explore some aspects of prenatal care, specifically the relationship between hematocrit and the incidence of preterm birth, among Hispanics.

Although no clinical recommendations can be made as a result of the findings of this study, it is hoped that this study has added to the body of knowledge which exists concerning the Hispanic population.

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APPENDIX A

Scale for Calculation of Sliding Fee (1990)

SALUD MEDICAL CENTER, INC. TABLE: M

FAMILY SIZE	A 0%			B 25%			C 50%			D 75%			E 100%	
1	0	to	6,280	6,281	to	8,420	8,421	to	10,560	10,561	to	12,700	12,701	to
2	0	to	8,420	8,421	to	10,560	10,561	to	12,700	12,701	to	14,840	14,841	to
3	0	to	10,560	10,561	to	12,700	12,701	to	14,840	14,841	to	16,980	16,981	to
4	0	to	12,700	12,701	to	14,840	14,841	to	16,980	16,981	to	19,120	19,121	to
5	0	to	14,840	14,841	to	16,980	16,981	to	19,120	19,121	to	21,260	21,261	to
6	0	to	16,980	16,981	to	19,120	19,121	to	21,260	21,261	to	23,400	23,401	to
7	0	to	19,120	19,121	to	21,260	21,261	to	23,400	23,401	to	25,540	25,541	to
8	0	to	21,260	21,261	to	23,400	23,401	to	25,540	25,541	to	27,500	27,501	to
9	0	to	23,400	23,401	to	25,540	25,541	to	27,500	27,501	to	29,460	29,461	to
10	0	to	25,540	25,541	to	27,500	27,501	to	29,460	29,461	to	31,420	31,421	to
11	0	to	27,500	27,501	to	29,460	29,461	to	31,420	31,421	to	33,380	33,381	to
12	0	to	29,460	29,461	to	31,420	31,421	to	33,380	33,381	to	35,340	35,341	to

APPENDIX B

Original and Revised Clinic Data Forms

ANTEPARTUM STATISTICS

Patient's Name: _____ Address _____ Phone # _____

SDLF Chart #: _____ DOB: _____

INITIAL VISIT:

1. COUNTY ☐
2. AGE ☐
3. WEEKS 1st Visit ☐
4. Pt. STATUS ☐
5. PAYMT. STATUS. ☐
6. EDUCATION ☐
7. GRAVIDA ☐☐
8. TERM ☐☐
9. PRETERM ☐☐
10. ABORTIDUS ☐☐
11. NOW LIVING ☐☐
12. INITIAL HGB ☐
13. INITIAL HCT ☐
14. RH TYPE ☐
15. MARITAL STATUS ☐
16. PREFERRED LANGUAGE ☐
17. STATED FEEDING PREF. ☐
18. HEIGHT ☐
19. REGISTRATION STATUS ☐
20. TEACHING ☐☐
21. INITIAL AP RISK SCORE ☐
22. REFERRAL ☐☐☐
23. ETHNIC CATEGORY ☐

Key:

(1) 1. Marion 2. Polk 3. Yamhill 4. Clackamas 5. Other

(2) 1. 10-14 2. 15-19 3. 20-34 4. 35-44

(3) 1. ≤ 12 2. 13-20 3. 21-28 4. 29-34 5. ≥ 35

(4) 1. Migrant 2. Seasonal 3. Other

(5) 1. 0% 2. 25% 3. 50% 4. 75% 5. 100%

(6) 1. ≤ 8 yrs. 2. 9-12 yrs. 3. 13-16 yrs. 4. ≥ 17 yrs.

Key cont'd

(7) thru (11) Write in # at time of registration.

(12) 1. ≤ 10 2. 10.1 - 10.9 3. 11.1 - 11.9 4. 12.0 - 12.9 5. ≥ 13.0

(13) 1. ≤ 30% 2. 30.1% - 32% 3. 32.1% - 34% 4. 34.1% - 36% 5. ≥ 36.1%

(14) 1. RH POSITIVE 2. RH NEGATIVE

(15) 1. Married 2. Single 3. Living With 4. Separated 5. Divorced

(16) 1. English 2. Spanish 3. Russian 4. Other

(17) 1. Breast 2. Bottle 3. Undecided

(18) 1. ≤ 59 in. 2. 60-64 in. 3. 65-68 in. 4. ≥ 69 in.

(19) 1. Initial Visit With Us 2. Transfer from another clinic 3. Transfer from private M.D. 4. Transfer from out of state 5. Other

(20) 1. Teaching Sheet 2. Informed/Consent 3. Other

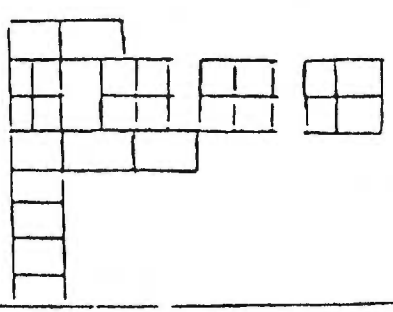
(21) 1. 1, 2 2. 3, 4 3. 5 6. ≥ 6

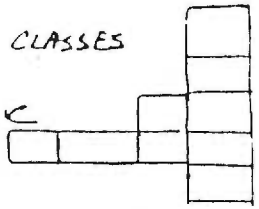
(22) 1. WIC 2. SDLF Comp. Clinic 3. Special Studies 4. Soc. Worker 5. OB-OHSU 6. M.D. 7. Other

(23) 1. Ang'o 2. Hispanic 3. Russian 4. Indian 5 Other

ANTEPARTUM SUMMARY:

1. # of PRENATAL VISITS
2. PROBLEMS IN PRENATAL PERIOD
3. MEDICATIONS RECEIVED
4. SPECIAL STUDIES
5. DOCUMENTED WT. GAIN
6. HCT AT 36 WEEKS
7. AP 36WK 2ISH SCORE
8. TYPE FEEDING
9. ATTENDED CHILDBIRTH CLASSES
10. ATTENDED C/S CLASS
11. TEACHING IN CLINIC
12. REFERRALS
13. FINAL STATUS





Key:

① Fill in #

② 1. Abnormal Pap
2. Abnormal presentation/lie
3. Active Herpes
4. Anemia
5. Antibody titer
6. Diabetic-insulin
7. Drug Abuse
8. Eclampsia
9. Gestational Diabetic-diet controlled
10. Gonorrhea
11. Late pre-natal care (> 28 wks)
12. Multiple Gestation
13. PIH
14. Poor Compliance & care
15. Pyelo
16. Smoker > ½ ppd
17. Suspected IUGR
18. Suspected LGA
19. Syphilis
20 URI
21. UTI (Asymp)
22. UTI (symp)
23 Vaginitis
24 Other
25 NONE

③ 1. Iron 2. Vitamins 3. Antibiotics 4. Vaginal Cream
5. Rho-GAM at 28 wks 6. URI meds 7. Other

④ 1. Ultrasound 2. BSST 3. NST 4. OCT
5. Fm Charts 6. 1° GTT 7. 3° GTT 8. Amnio
9. Genetic Screen 10. Genetic Counsel 11. Ab screens

⑤ 1. ≤ 5 lbs 2. 6-10 lbs 3. 11-15 lbs. 4. 16-20 lbs
5. 21-25 lbs 6. 25-30 lbs 7. 31-35 lbs. 8. 36-40 lbs
9. ≥ 41 lbs.

⑥ 1. ≤ 30% 2. 30.1% - 32% 3. 32.1% - 34%
4. 34.1% - 36% 5. ≥ 36.1%

⑦ 1. 0 2. 1-2 3. 3, 4 4. 5-6 5. ≥ 7

⑧ 1. Breast 2. Bottle 3. Both

⑨ 1. Yes, 2 & self 2. Yes, 1 & self 3. Yes, & other 4 No

⑩ 1. Yes & self 2. Yes, & other
3. No.

⑪ 1. Teaching Sheet V'ed
2. InP/Consent

⑫ 1. WIC 2. Spec Studies
3. self-Comp Cl. 4. Soc. Worker
5. CB-CHSU 6. M.D. 7. OTHER

⑬ 1. Delivered with us/self
2. Migrated
3 Transferred 2° High Risk
4. Transferred to private M.D.
5. Lost to Follow-up
6. Other 7. Trans/Distance

Name

EDC

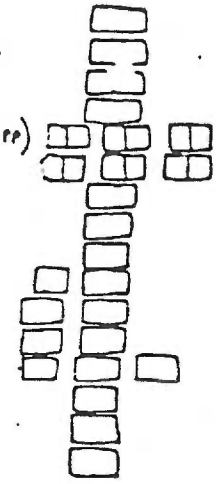
INTRAPARTUM STATISTICS

Pt's NAME: _____ HOSP#_____ SOL#_____

DELIVERY DATE: _____ BABY'S HOSP#_____

LABOR & DELIVERY:

1. FREE DELIVERY STATUS
2. POST DELIVERY STATUS
3. SITE of DELIVERY
4. INTRAPARTUM RISK SCORE
5. COMPLICATIONS (IP - IMMEDIATE PP)
6. FIRST STAGE MEDS
7. LENGTH OF 1ST STAGE
8. LENGTH OF 2nd STAGE
9. EBL
10. PERINEUM
11. 2nd STAGE MEDS
12. MIDWIFE
13. SPECIAL STUDIES
14. TYPE OF DELIVERY
15. DELIVERED BY
16. MANAGEMENT



KEY:

1. 1. Short Stay - SDP 2. Extended Stay 3. Routine Stay - MD 4. Other
2. 1. Short Stay - SDP 2. Extended Stay 3. Routine Stay - MD 4. Mom - SDP Baby - EVP 5. Other
3. 1. Hospital 2. Clinic 3. CAR 4. Other
4. 1. 1,2 2. 3,4 3. 5-6 4. 7
5. 1. Downs BTL 2. Eclampsia 3. Epidural 4. Fetal Distress 5. Fever Unknown Origin 6. Forceps Del. 7. Excessive Blood Loss 8. Gestational Diabetes 9. Infection 10. Laceration - 4° 11. Malpresentation 12. None 13. Pre-eclampsia 14. Post-Dates 15. Prolonged Labor 16. Psych/Social 17. Repeat C/S 18. Spinal Anesth 19. VBAC 20. Other_____

6. 1. None 2. Demerol 3. Epidural 4. Hyst 5. Morphine 6. Nisentil 2cmg 7. Nisentil >2cmg 8. Pitocin for Aug. 9. Pitocin for Ind. 10. Scopol 11. Spinal 12. Vistaril 13. Other

7. 1. 0-4 hrs 2. >4-8 hrs. 3. >8-12 hrs 4. >12-16 hrs 5. >16 hrs.

8. 1. 01-20 min 2. 21-40 min 3. 41-60 min. 4. 61-90 min 5. 91-120 min 6. 2 121 min.

9. 1. 0-250cc 2. 251-499cc 3. 500-800cc 4. 801-1000cc 5. > 1000cc

10. 1. Intact 2. Minor lac - no repair 3. 1° 4. 2° 5. 3° 6. 4° 7. Midline Epis. 8. Mediolateral Epis.

11. 1. None 2. Local ā del. 3. Local p̄ del. 4. Pudental ā del. 5. Pudental p̄ del. 6. Spinal 7. Epidural 8. Nisentil 9. Other

12. 1. None 2. EFM 3. Internal FM

13. 1. U/S 2. Fetal Scalp Sample 3. Pre-eclam. labs 4. Other_____ 5. None

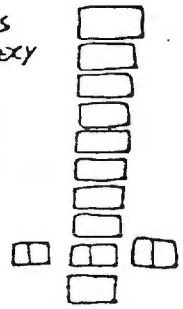
14. 1. NSVD 2. Forcep 3. C/S 4. VBAC 5. Breech 6. Other_____

15. 1. CNM 2. CNM/Student 3. M.D. 4. Other_____

16. 1. CNM 2. Collaborative 3. MD

NEWBORN

1. EGA by DATING PARAMETERS
2. WEEKS GESTATION AT DELIVERY
3. BIRTH WEIGHT
4. SIZE / AGE STATUS
5. APGAR 1°
6. APGAR 5°
7. SEX
8. ADMISSION STATUS
9. PROBLEMS
10. TYPE FEED



KEY:

1. 1. ≤ 36 2. 37 3. 38 4. 39 5. 40 6. 41 7. 42 8. ≥ 43
2. 1. ≤ 36 2. 37 3. 38 4. 39 5. 40 6. 41 7. 42 8. ≥ 43
3. 1. ≤ 2000gr. 2. 2001 - 2500 gr. 3. 2501 - 3000 gr. 4. 3001 - 3500 gr. 5. 3501 - 4000 gr. 6. > 4000
4. 1. AGA 2. SGA 3. LGA
5. FILL IN
6. FILL IN
7. 1. FEMALE 2. MALE
8. 1. SHORT STAY - SDP 2. Extended Stay 3. Other _____
9. 1. Anemia 2. Hypoglycemia 3. + direct Coombs 4. Infection - needed antibiotics 5. Jaundice 6. Major Anomaly 7. Meconium Stained 8. Minor Anomaly 9. Multiple Gestation 10. Polycythemia 11. Stillbirth 12. Other_____
10. 1. Breast 2. Bottle 3. Both 13. None

POST-PARTUM AND NEWBORN STATISTICS
SIX WEEKS

Pt's. NAME: _____ SDF # _____

NEWBORN'S SDF# _____ KEY: _____

POST-PARTUM PERIOD

(1) SEXUALLY ACTIVE POST DELIVERY
(2) USED CONTRACEPTION POST DELIVERY
(3) TYPE OF CONTRACEPTION USED
(4) BIRTH CONTROL METHOD DESIRED
(5) BIRTH CONTROL METHOD RECEIVED
(6) HCT (All 1a. or 1b before)
(7) PAP
(8) # OF VISITS IN SIX WEEKS
(9) PROBLEMS
(10) DID NOT RETURN FOR SIX WEEKS F/U

(1) 1. Yes 2. No
(2) 1. Yes 2. No
(3) 1. None 2. Foam 3. Condom
4. Sponge 5. Withdrawal
6. Vaginal Suppository 7. Other
(4) 1. None
2. Birth Control Pills
3. Diaphragm
4. Condoms
5. Foam
6. I.U.D.
7. Tubal
8. Vaginal Sponge
9. Vaginal Suppository
10. Vasectomy 12. Meth' From. Plug.
11. Withdrawal 13. Other

(5) 1. None
2. Birth Control Pills
3. Diaphragm.
4. Condoms
5. Foam
6. I.U.D.
7. Tubal
8. Vaginal Sponge
9. Vaginal Suppository
10. Vasectomy
11. Withdrawal
12. Natural Family Planning
13. Other _____

(6) Fill in
(7) 1. Cl. I 2. Cl. II 3. Cl. III
4. Cl. IV 5. Follow-up lost

(8) 1. 1 2. 2 3. 3,4 4. 5,6 5. >6

(9) 1. None
2. Breast Engorgement
3. Endometritis
4. Mastitis
5. Perineal Dehiscence
6. URI
7. UTI
8. Other

(10) 1. Not Applicable 2. Arranged for care elsewhere
3. Migrated 4. Lost to follow-up

NEWBORN: 6 WEEKS
(1) WEIGHT
(2) WEIGHT WNL
(3) CIRCUMSIZED
(4) PROBLEMS
(5) TYPE FEEDING
(6) INITIAL IMMUNIZATIONS
(7) DID NOT RETURN FOR F/U

KEY:
(1) Fill in (in grms)
(2) Yes No
(3) 1. Not Applicable (Female)
2. Yes 3. No.
(4) 1. Conjunctivitis
2. Neonatal Death
3. Failure to thrive
4. Jaundice
5. Infection
6. Rehospitalized
7. Skin problems
8. URI
9. Other

(5) 1. Breast 2. Bottle 3. Both
4. Solids
(6) 1. Received 2. Delayed 3. Declined by parents 4. Not done
5. Did not keep appmt.
(7) 1. Not applicable 2. Arranged for care elsewhere 10 MONS
3. Migrated 4. Lost to Follow-up

MATERNITY STATISTICS FORM

Client's Name_____Salud #_____

First Visit_____

1. Age_____

2. Marital Status
   1. Married 2. Divorced 3. Widowed
   4. Separated 5. Living with 6. Single

3. Ethnicity
   1. Hispanic 2. Russian 3. Anglo
   4. Black 5. Asian 6. Other

4. Preferred Language
   1. Spanish 2. English 3. Russian
   4. Indian dialect 5. Bilingual-Sp/Eng 6. Other
   7. Bilingual- Other _____

5. G_____ T_____ P_____ A_____ L_____

6. Years of Education_____

7. County of Residence
   1. Clackamas 2. Marion 3. Polk
   4. Yamhill 5. Multnomah 6. Other_____

8. Registration Status
   1. Initial Visit
   2. Transfer from another provider _____

9. At first visit, weeks gestation_____

10. Initial Risk Score_____ 37 Week Risk Score _____

11. Months from last delivery to LMP 1. _____ 2. NA 3. >2yrs.

12. Initial HCT _____

13. Feeding Preference
   1. Breast 2. Bottle 3. Both 4. Undecided

14. Payment Status
   1. Medicaid 2. 25% (B) 3. 50% (C)
   4. 75% (D) 5. 100% (E) 6. Family Health Net
   7. Private Insurance

15. 1. Migrant 2. Seasonal 3. Other

16. Total number prenatal visits _____

COMPLETE THE FOLLOWING AT 6 WEEKS AND REMOVE FROM CHART:

17. Sexually active post delivery? 1. Yes 2. No

18. Used contraception 1. Yes 2. No 3. NA

19. Type of contraception used _____

20. Contraception desired _____

21. Contraception received _____
    1. None 2. Micronor 3. Combined OCPs
    4. Diaphragm 5. Condoms 6. Foam
    7. IUD 8. Sponge 9. Suppository
    10. Withdrawal 11. BTL 12. Vasectomy
    13. Natural Fmily Planning 14. Other _____ 15. N/A

22. HCT _____

23. Pap: 1. Cl.I 2. Cl. II 3. Cl. III 4. Cl. IV 5. Repeated

24. Number of visits in 6 weeks _____

25. Problems
    1. None 2. Breast engorgement 3. Endometritis
    4. Mastitis 5. Perineal dehisence 6. URI
    7. UTI 8. Other _____

26. Did not return for 6 weeks F/U.
    1. N/A 2. Arranged for care elsewhere
    3. Migrated 4. Lost (Letters sent X _____)

Newborn

27. Weight _____

28. Weight WNL? 1. Yes 2. No

29. Circumcised? 1. Yes 2. No 3. N/A

30. Problem 0. None
    1. Conjunctivitis 2. Neonatal death 3. Failure to Thrive
    2. Jaundice 5. Infection 6. Rehospitalized
    7. Skin problems 8. URI 9. Other

31. Immunizations 1. Received 2. Delayed 3. Declined

32. Did not return for F/U
    1. N/A 2. Arranged for care elsewhere
    2. Migrated 4. Lost

33. Type of feeding 1. Breast 2. Bottle 3. Both

34. Place of delivery 1. Salem 2. Silverton 3. OHSU 4. Other

35. Type of delivery 1. Vaginal 2. VBAC 3. C/S

AN ABSTRACT OF THE THESIS OF

Sharon Gorman and Doreen Liebertz

For the MASTER OF SCIENCE IN NURSING

Title: THE RELATIONSHIP OF HEMATOCRIT AND THE INCIDENCE OF PRETERM BIRTH IN A HISPANIC POPULATION

Approved:

Carol Howe, C.N.M., D.N.Sc., Thesis Advisor

The purpose of this study was to examine the relationship between a low hematocrit and the incidence of preterm birth in a Hispanic population. Selected variables which have been associated with preterm birth in the general population and their relationship with preterm birth among Hispanics were explored. The literature reports conflicting relationships between hematocrit and preterm birth in the general population and no literature was found which studied this relationship in the Hispanic population. Therefore, a descriptive design was used to evaluate the relationship between hematocrit and preterm birth in a Hispanic population.

The study was performed using existing data from a migrant health clinic in rural Oregon. The sample consisted of 517

Hispanic women delivering a baby from 1985 through 1989 with the nurse-midwifery service of the clinic.

No significant relationships were found between a low hematocrit and the incidence of preterm birth in the total sample, but there was a low significant relationship in the 1989 data set most likely because analysis of raw rather than categorized data was possible. Pearson's r analysis revealed no significant relationships between preterm birth and the other variables thought to be associated; age and marital status. Paired t-test analysis of 13 additional variables (a categorized initial hematocrit, an actual number of the initial hematocrit, the woman's gravidity, pre-eclampsia and eclampsia, gestational diabetes, multiple gestation, syphilis, pyelonephritis, urinary tract infections, both symptomatic and asymptomatic, other types of infections, and prenatal visits) was accomplished through matching the preterm birth group and the term birth group on age, previous preterm birth, and weeks gestation at first visit. No significant differences were noted except the number of prenatal visits. This finding is likely explained by the clustering of prenatal visits in the third trimester.

These results suggest that these may be a possible relationship between a low hematocrit and incidence of preterm birth among Hispanic women. This is especially evident in the 1989 data set in which the actual rather than categorized initial

hematocrit was used.

The sample was primarily foreign-born migrant agricultural workers whose socioeconomic status for the most part did not vary. This limits the generalizability of the findings to other populations. Also, there was a very small number of women (23) who experienced a preterm birth in the total sample. This severely limits the confidence one can place on the findings.