



Birth outcomes and chronic social stress: Racial and socioeconomic disparities in rates of low birth weight infants

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Stratified health

The United States of America has the highest GNP in the world and spends more than three trillion dollars on healthcare per year.¹ Despite the wealth and resources available in the United States, Americans as a whole lead less healthy lives than people in almost all industrialized countries. There is reason to believe that social inequality is the driving force behind poor health outcomes. Despite rhetoric of equal opportunity and egalitarian ideals, health and social stress are stratified along racial and socioeconomic lines. Position in the social hierarchy is predictive of both chronic social stress and incidence of poor health outcomes such as low birth weight.⁶ The result is that poor and minority newborns bear a disproportionate burden of unhealthy birth outcomes and infant mortality.

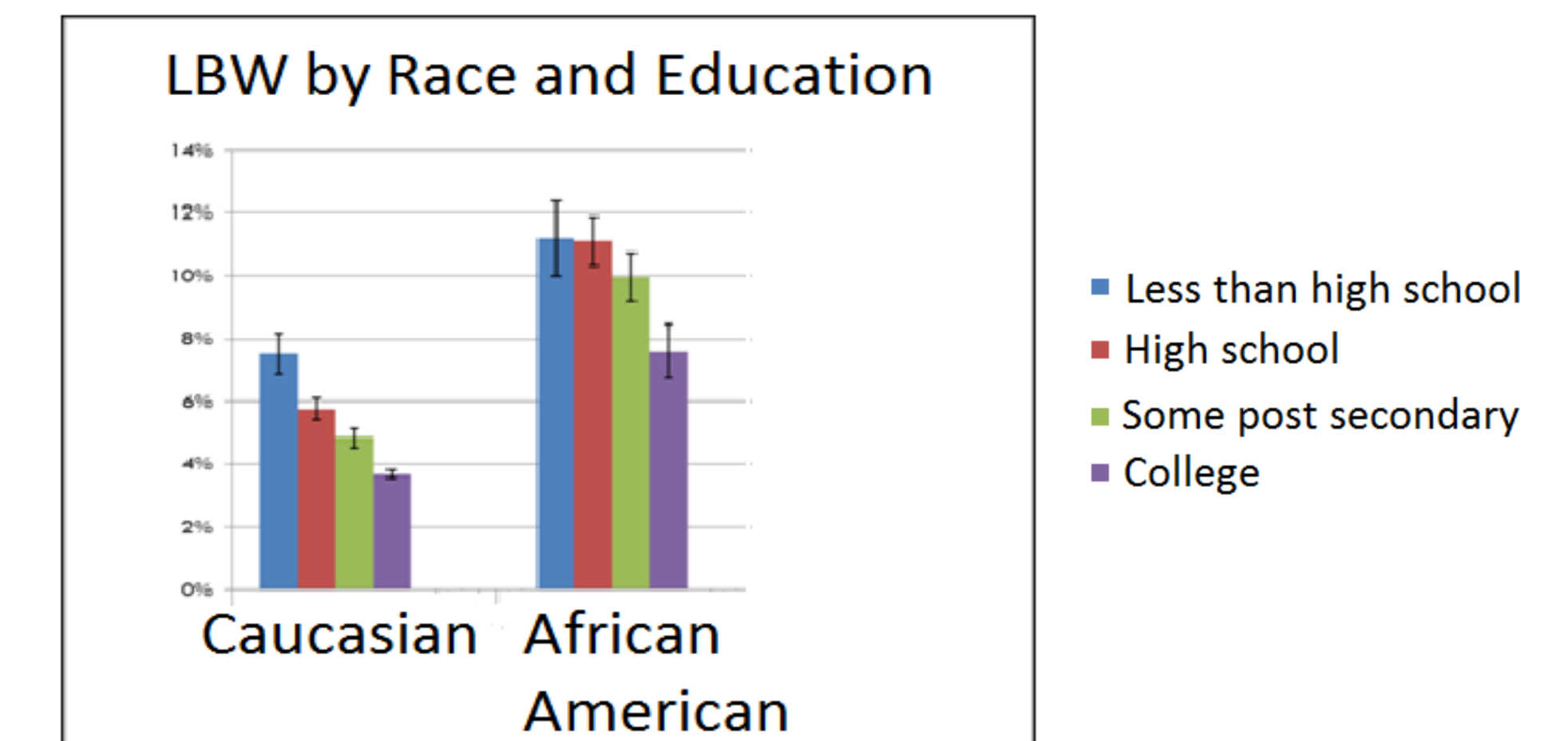
Low Birth Weight (LBW)

Newborns are classified as LBW if they weigh less than 2500g or 5 pounds 8 ounces.

The United States ranks 41st in neonatal mortality, and functional immaturity at birth is a leading cause of infant death.³ Over the past decade, the frequency of premature birth has fallen, but the rate of LBW has increased. The most recent census shows that 8.2 percent of American babies are born with LBW.⁹ Neonatal care of LBW infants accounts for one half of the healthcare costs for all newborns.²

LBW is associated with functional immaturity at birth as well as adult health problems including cardiovascular disease, type II diabetes, psychological disorders, and vision and hearing impairment.²

Racial and SES disparities in LBW



LBW follows a socially graded distribution mirroring the social hierarchy, with both race and SES predicting risk of LBW. 13.4 percent of African American babies are born with LBW, but the rate is only 7.1 percent for Caucasians⁹. Racial differences in LBW persist when controlling for SES, but SES is predictive when controlling for both race and age.

Social stress

Minority and low SES individuals report more total stress than Caucasians or higher SES counterparts.⁸ This social discrepancy translates into a physiological difference in the stress response. An attenuated cortisol response and raised baseline cortisol have been observed among groups who experience chronic psychosocial stress.⁶

Up to 75 percent of African Americans report experiencing discrimination—including employment and housing discrimination, racial profiling, or receiving inferior service.⁷ Those who experienced chronic racism had lower self efficacy and more total stress.

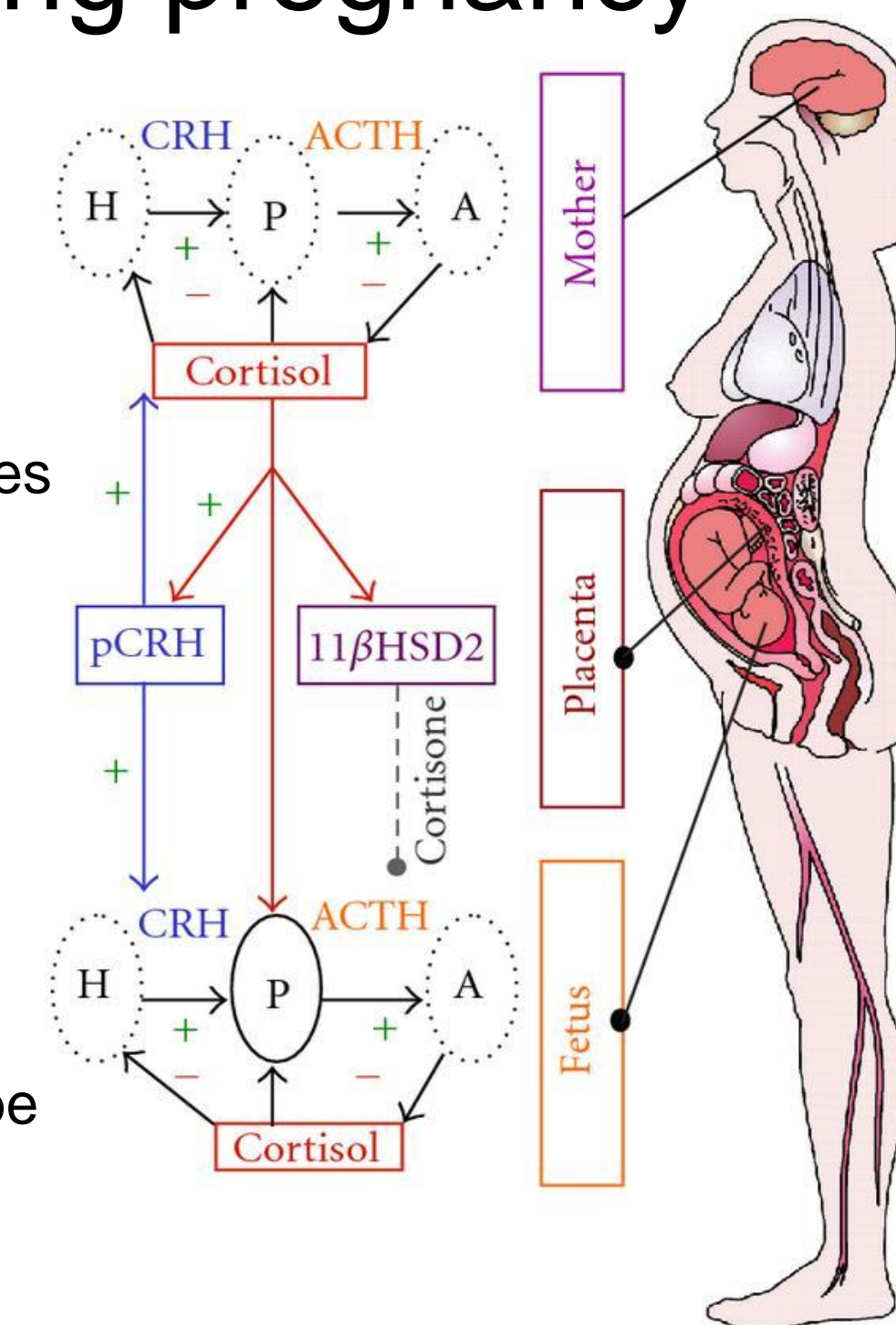
People with lower SES experience social subordination and perceive less control over their work. As a result, they tend to have an external locus of control, lower self efficacy, and higher, less responsive baseline cortisol levels.⁸

The HPA axis during pregnancy

Social stress can hyper activate the stress response system during pregnancy by increasing maternal ACTH and cortisol. 11 β HSD2 should protect the fetus from maternal cortisol, but 10-20 percent still crosses the placenta.^{4,5}

Maternal cortisol accounts for approximately 20 percent of the variance in birth weight and 10 percent of the variance in length.⁴

Pregnancies associated with high cortisol are 2.7 times more likely to be unsuccessful, and 83 percent of preterm births can be predicted by maternal cortisol levels.⁴



Mechanisms linking chronic stress and LBW

- Direct action by cortisol**
Enough maternal cortisol crosses the placenta to double fetal cortisol levels.⁵ It is assumed that this rise in hormones changes the intrauterine environment in ways that impede normal development, perhaps by inducing allostatic load in the fetus.
- Uterine artery vasoconstriction**
Chronic HPA axis activation releases cortisol and norepinephrine. These hormones cause vasoconstriction of the uterine artery, which reduces blood flow to the placenta. This reduces the amount of oxygen and nutrients delivered to the fetus, limiting growth.⁵

Individual stress management

Increasing self efficacy and coping strategies for at risk women might reduce the rate of LBW.

One promising strategy is stimulating pressure receptors to reduce cortisol levels which increases fetal vagal activity. High vagal activity stimulates the gastric system, promotes weight gain, and reduces the risk of LBW.⁵

Exercise, yoga, and massage therapy all stimulate pressure receptors, and they are correlated with lower cortisol levels and increased birth weight.⁵



Structural solutions



The National Healthy Start Association created a series of programs called Healthy Start which integrate community residents, pregnant clients, medical professionals, social service workers, and businesses in order to improve birth outcomes in poor neighborhoods and communities of color (www.nationalhealthystart.org).

They aim to provide adequate prenatal care, meet basic nutritional needs, assist with housing, provide psychosocial support, and empower pregnant women.

A similar family health services center—which provides employment help, financial planning, family support, and prenatal care—successfully reduced the incidence of LBW in their clients by one half.¹

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