Preterm Birth

Preterm birth is an intractable public health problem, affecting more than 500,000 infants per year in the United States. The etiology of preterm birth is complex, but is believed to involve a combination of maternal, genetic and environmental factors. "Red flags" of environmental influences examine the effects of nutrition, substance abuse, psychosocial stress, and pollution on the maternal obstetric outcome and risk for preterm birth. While the biological mechanisms that lead to negative birth outcomes continue to be studied, potential mechanisms include oxidative stress, hypoxia, and inflammatory responses.

In September 2013, the American Congress of Obstetricians and Gynecologists, along with the American Society of Reproductive Health Professionals, issued a Committee Opinion entitled: Environmental Chemicals Harm Reproductive Health. The document acknowledges the danger of prenatal exposure to toxicants, and gives advice on counseling clients, screening for exposures, and providing prenatal environmental health assessment tools. The Green Choices Project and the Alliance of Nurses for Healthy Environments provide examples of prenatal environmental health assessment tools, and are available online.

Screening for Exposures

Although risk reduction is an important prevention measure, many exposures are not available on an individual basis. The federal Toxic Substances Control Act of 1976 governs the regulation of chemicals in the marketplace. The law has not been updated in nearly 40 years and is inadequate to protect public health. The law has not been updated in nearly 40 years and is inadequate to protect public health.

The annual National Ambient Air Quality Standards for carbon monoxide (CO), nitrogen dioxide (NO2), and other pollutants must be reviewed and updated every five years. Currently, the most recent updates occurred in 1987. The Environmental Protection Agency (EPA) and the USEPA set national limits for these pollutants. The USEPA is mandated to review these standards every five years and determine if the current standards are adequate to protect public health.

Air pollution has the largest evidence base of any environmental contributor to preterm birth and poor birth outcomes. Epidemiological and animal studies link particulate matter (PM2.5 and PM10) and sulfur dioxide (SO2), as well as carbon monoxide (CO) and nitrogen dioxide (NO2) in ambient air to shorter gestation. In 2012, the USEPA strengthened the annual National Ambient Air Quality Standard for fine particles (PM2.5) reducing it to 12.0 micrograms per cubic meter (ug/m3). In 2013, the USEPA issued a decision in a court case to maintain existing National Ambient Air Quality Standards for carbon monoxide at 9 parts per million (ppm) for 8 hour time. Supporting strong national policy for clean air quality standards protects pregnant women and their developing fetuses from an important risk factor for preterm birth.

Counseling Clients

Prematurity and low birth weight contribute significantly to infant mortality. Interventions that prevent or limit exposures to toxicants during the perinatal period are a valuable public health strategy. The Green Choices Project, UCSF Program on Reproductive Health and the Environment, the Association of Reproductive Health Professionals, and the Collaborative on Health and the Environment provide education and materials for counselors on risk reduction strategies.

Clean Air Standards

Air pollution has the largest evidence base of any environmental contributor to preterm birth and poor birth outcomes. Epidemiological and animal studies link particulate matter (PM2.5 and PM10) and sulfur dioxide (SO2), as well as carbon monoxide (CO) and nitrogen dioxide (NO2) in ambient air to shorter gestation. In 2012, the USEPA strengthened the annual National Ambient Air Quality Standard for fine particles (PM2.5) reducing it to 12.0 micrograms per cubic meter (ug/m3). In 2013, the USEPA issued a decision in a court case to maintain existing National Ambient Air Quality Standards for carbon monoxide at 9 parts per million (ppm) for 8 hour time. Supporting strong national policy for clean air quality standards protects pregnant women and their developing fetuses from an important risk factor for preterm birth.

References

Available on the APAH 2013 Annual Conference website or by email request.