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Brain Function Linked to Birth Size; Study Sheds Light on Mental Health Problems Later in Life

ScienceDaily (Feb. 18, 2011) – Scientists have discovered the first evidence linking brain function variations between the left and right sides of the brain to size at birth and the weight of the placenta. The finding could shed new light on the causes of mental health problems in later life.

The research, conducted at the University of Southampton and the Medical Research Council (MRC) Lifecourse Epidemiology Unit at Southampton General Hospital, reveals that children who were born small, with relatively large placentas, showed more activity on the right side of their brains than the left. It is this pattern of brain activity that has been linked with mood disorders such as depression.

The study adds to a growing body of evidence showing that adverse environments experienced by fetuses during pregnancy (indicated by smaller birth size and larger placental size) can cause long-term changes in the function of the brain.

“The way we grow before birth is influenced by many things including what our mothers eat during pregnancy and how much stress they are experiencing. This can have long-lasting implications for our mental and physical health in later life,” explains Dr. Alexander Jones, an epidemiologist, who led the study at the University of Southampton.

“This is the first time we’ve been able to link growth before birth to brain activity many years later. We hope this research can begin to shed new light on why certain people are more prone to diseases such as depression.”

The neurological responses of 140 children from Southampton, aged between eight and nine, were monitored for the study. Tests evaluated blood flow to the brain in response to increased brain activity, exposing differences in the activity of the two sides. Dr Jones measured tiny fluctuations in the temperature of the tympanic membrane in each ear, which indicate blood flow into different parts of the brain.

Disproportionate growth of the placenta and the fetus is thought to occur in pregnancies where the mother has been experiencing stress or where there have been problems with the availability of nutrients. Previous research has linked this pattern of growth to other diseases such as hypertension and greater physical responses to stress in later life.

The research by Dr. Jones and colleagues, has been published in the online science journal, PLoS ONE.

Source: Alexander Jones, Clive Osmond, Keith M. Godfrey, David I. W. Phillips. Evidence for Developmental Programming of Cerebral Laterality in Humans. PLoS ONE, 2011; 6 (2): e17071 DOI: 10.1371/journal.pone.0017071