



NUTRITION & YOUR CHILD

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MOTHERS WITH UNRESOLVED CHILDHOOD TRAUMA SHOW BLUNTED AMYGDALA RESPONSE TO INFANT DISTRESS

A recent study led by researchers at Baylor College of Medicine has uncovered new clues about the neurobiological effects of trauma mothers experience that can affect their attachment to their child.

While the neurobiology of post-traumatic stress disorder has been extensively researched, much less attention has been paid to the neural mechanisms underlying more hidden but pervasive types of trauma (e.g., those involving disrupted relationships and insecure attachment), the team wrote in the new study published in the journal *Social Neuroscience*.

Led by Dr. Sohye Kim, Baylor postdoctoral associate in Dr. Lane Strathearn's lab, the study shows that mothers who experienced childhood trauma (such as physical abuse, abandonment or neglect)—that remains unresolved into adulthood—have a striking deficit in brain activation when they view pictures of their own infant in distress.

The study involved 42 first-time mothers enrolled during their pregnancy. Upon enrollment, the mothers participated in an interview which delved into their own childhood experiences, and traumatic events that they may have encountered, to categorize the mothers with unresolved trauma and those with no trauma (i.e., normal comparison mothers).

Several months after delivery, their babies were videotaped. Both smiling and crying face images were later shown to the mothers during a functional magnetic resonance imaging scanning session to measure their brain response to the images.

CONTINUED ON PAGE 4

IDENTITY

OWN

UNKNOWN



HAPPY

EFFECT

SAD

UNDERSTANDING WHY AMERICANS ARE NOT ADHERING TO DIETARY GUIDELINES

The U.S. Dietary Guidelines can help Americans achieve a healthy diet but research has shown that the majority of the U.S. population does not meet the recommendations for consumption of low-fat dairy, whole grains as well as fruits and vegetables.

A new study by researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine and other institutions shed light on what's preventing Americans from meeting the recommendations, and what might help them achieve them.

"Not many studies have looked at barriers that prevent or facilitators that enhance compliance with the Guidelines, but it's important to do so to help people come closer to meeting the Dietary Guidelines for Americans," said Dr. Theresa Nicklas, professor of pediatrics at the CNRC and lead author of the study, which appeared in the *Journal of the Academy of Nutrition and Dietetics*.

Separate discussion groups of children and adults were held with a leader who used a standard method to get participants to indicate what their most important reasons for being willing or unwilling to include the foods recommended in the Dietary Guidelines in their diet. The multi-site study included 280 adults and 320 fifth-grade children.

Core barriers among children were competing foods like soda and sugary foods, health concerns such as allergies or upset stomach and taste. Core barriers among adults were lack of meal preparation skills or recipes, cost, difficulty in changing eating habits and taste. Both groups also indicated a lack of understanding about the recommendations and their importance.

Key factors that facilitate adherence to the guidelines were understanding the health benefits of certain foods, increasing availability, accessibility and affordability and guidance on food preparation.

Learning and understanding these barriers and facilitators will help shape future obesity and chronic disease intervention programs, Nicklas said. To be

CONTINUED ON PAGE 4

NEW LIPID FORMULAS PREVENT LIVER DISEASE IN PIGLETS



Each year, more than half-a-million infants are born prematurely in the United States and have immature guts that cannot absorb enough food to sustain life. In order to nourish these babies, physicians use a life-saving therapy called total parenteral nutrition in which an emulsion of fluid containing electrolytes, glucose, amino acids, vitamins, minerals and often lipids is introduced into the infant's body intravenously.

In this country, the only such lipid emulsion approved for use in infants is based on soybean oil, called Intralipid®. Unfortunately, if the babies remain on this emulsion for a long period, they develop what is called parenteral nutrition-associated liver disease (PNALD), which can be life-threatening. New emulsions that contain other sources of oil are approved in Europe and may provide a healthier alternative to soybean oil for premies.

"We knew using a fish-based oil could reverse the liver disease in children, but we do not know if it can prevent it," explained Dr. Douglas G. Burrin, USDA/ARS animal physiologist and professor of pediatrics at Baylor College of Medicine. In a study reported in the *Journal of Lipid Research*, he and colleagues tested two new lipid emulsions in premature, newborn piglets. One group received the traditional soybean-oil based emulsion, while the others received one of two new emulsions; one based on pure-fish oil or the other which is composed of a mixture that contained soybean oil, medium chain triglycerides and olive and fish oils.

They found that the pigs on the two new emulsions—one containing pure fish oil and the other with 15 percent fish oil—were less likely to develop PNALD.

"These new emulsions have been in development for several years," said Burrin. "They are an important source of nutrition in the form of fat for adults and babies who cannot eat by mouth. There is a large population of babies who need this for optimal growth. Only one is approved by the FDA." The fish oil supplement called Omegaven® has limited approval for use in the U.S., and is only available for "compassionate use" on a case by case basis in infants who develop the liver disease. The blended mixture emulsion (SMOFlipid®) is approved for pediatric use only in Europe.

Doctors at Texas Children's Hospital have been treating dozens of babies with liver disease using the pure fish oil emulsion (Omegaven®) on the basis of compassionate use. According to Dr. Steven Abrams, professor of pediatrics and an expert on the nutrition of premature babies at Texas Children's Hospital, "Our results have been excellent with most of the babies doing very well and having an almost complete recovery of their liver disease."

The new emulsions are caught in a "catch-22 situation" in this country. Many physicians do not feel they can be approved without a "gold standard" randomized controlled trial that compares the newer forms against the approved version. Other physicians, however, feel that a randomized trial (in which neither the physician nor the patient knows who is getting which emulsion) would be unethical because the new emulsions have been so effective in compassionate use, after children have developed liver disease.

Burrin's team was awarded a new NIH grant recently to further investigate how the newer emulsions prevent liver disease using their lab's premie piglet model.

Others who took part in this research include: Kenneth Ng, Barbara Stoll, Nancy Benight and Shaji Chacko, all of the USDA/ARS Children's

Houston-area residents are invited to participate in the nutrition research projects shown below which are designed to help CNRC scientists learn more about the nutritional needs of children. Free parking is provided. For most studies, financial compensation is provided and transportation may be available.

FOR MORE INFORMATION, CONTACT
Marilyn Navarrete at 713.798.7002
or rilynn@bcm.edu.

VOLUNTEERS

Seeds NEW!

Help researchers learn about children's eating experiences by participating in healthy eating classes and eating activities with other families. All moms will be compensated for their time each testing day. The classes will be held in the following zip codes: 77004 and 77039. Please call Sandra Lopez at 713.798.6779 or Andrea Jaramillo at 713.798.6747 for more information.

Latino Fathers Study NEW!

Researchers at Baylor College of Medicine want to interview Latino fathers about how to effectively recruit and engage other Latino fathers in public health children's research studies. Interviews can be conducted in person or by phone. Participants must be 18 years or older, Latino/Hispanic male and the father of a healthy 3- to 5-year-old child. For more information contact PadresStudy@bcm.edu.

Type 1 Diabetes Study NEW!

Adults ages 18 to 50 who have been diagnosed with type 1 diabetes for more than a year are needed for a study that will evaluate the usefulness of a mini-glucagon dose for treatment of low blood sugar. To qualify, your diabetes must be well controlled and you must be on an insulin infusion pump. Study involves blood tests. For more information call 713.798.7002 or e-mail mhaymond@bcm.edu.

SUN Study NEW!

Boys and girls ages 8 to 13 years are needed to test an e- button on their clothes that takes pictures of what they eat during a meal at the Children's Nutrition Research Center. Study involves a two-hour visit, a meal and an interview. Call Marilyn at 713.798.7002 or e-mail foodkids@bcm.edu about SUN Study.

Games for Health NEW!

Children ages 10 to 12 years, are needed for a 6-month study to understand how to help them eat healthier and be more physically active. Must play two "Games for Health" video games and provide three blood samples. Sign up at www.g4hstudy.org/s3/Eligibility. Watch game trailers at <https://www.youtube.com/watch?v=K89f7lqFJ-w> and https://www.youtube.com/watch?v=3e2z0L_bpZM.

Active Video Games NEW!

8- to 11-year-old boys and girls are needed to participate in study testing physical activity and videogame play. Study involves playing a videogame, questionnaires and measures of physical activity at the Children's Nutrition Research Center.

Mobile Video Game Study NEW!

Mothers ages 20 to 45 with children ages 3 to 5 years are needed to test a mobile video game prototype followed by an in-person interview about their experience at the Children's Nutrition Research Center. Compensation provided. If interested, call Marilyn at 713.798.7002 or e-mail foodkids@bcm.edu.

CONTINUED ON PAGE 3

LIPID FORMULAS (CONTINUED FROM PAGE 2)

Nutrition Research Center at Baylor as well as the department of pediatrics at Baylor; Deborah Schady and Milton L. Finegold of the Baylor department of pathology; Oluyinka Olutoye of the department of pediatric surgery at Baylor; Hester Vlaardingerbroek and Johannes B. van Goudoever of Sophia Children's Hospital in Rotterdam, The Netherlands; Leo A.J. Kluijtmans of Radboud University Nijmegen Medical Centre in The Netherlands; Wim Kulik of the University of Amsterdam in The Netherlands; and E. James Squires of the University of Guelph in Guelph, Ontario.

Funding for this came from the U.S. Department of Agriculture, Agricultural Research Service (Cooperative Agreement Number 58-6250-0-008), the American Society for Parenteral and Enteral Nutrition, the Texas Medical Center Digestive Diseases Center (NIH Grant P30 DK-56338), Ter Meulen Fund of the Royal Netherlands Academy of Arts and Sciences, a grant from the Young Investigator Exchange Program of the International Pediatric Research Foundation, and a research fellowship grant of the Sophia Kinderziekenhuis Fonds, Rotterdam, The Netherlands and the American Liver Foundation.

VOLUNTEERS (CONTINUED)

Breakfast Study

Children who are 8 to 10 years old are needed for a study on breakfast consumption and mental abilities. The study includes three overnight visits to the CNRC. There will be blood draws at each visit (numbing creams and sprays are available).

Butterfly Girls

8- to 10-year-old African American girls and a parent needed to participate in an 8 week online program promoting healthy eating and physical activity. No meetings to attend; participate from the comfort and convenience of home. Watch informative video at <https://www.bcm.edu/research/centers/childrens-nutrition-research-center/butterflygirl/butterflygirlintrovideo.html>.

Cardiovascular Study

13- to 18-year-old adolescents and young adults (normal weight and overweight) with and without type 2 diabetes are needed for a research study investigating risk for heart disease in youth. Study involves body composition, heart scan and blood tests.

Fatty Liver

11- to 21-year-old overweight adolescents and young adults with and without liver disease are needed for a research study investigating risk for early heart disease in youth. Study involves body composition, liver scan and blood tests.

Pregnancy & Child Health

Did you have a pregnancy complicated by preeclampsia or a baby with low birth weight? Can a complicated pregnancy in mom put the child at risk for future health problems? To answer this question, we are conducting a research study that looks at pregnancy history and its effect on the child's health. 8- to 11-year-old children of both eclamptic and non-preeclamptic pregnancies are needed as well as 8- to 17-year-olds of pregnancies with high blood pressure. Study involves body composition and blood tests.

ROLE OF PARENTING STYLE IN CHILD'S WEIGHT

Parenting styles, the overall attitude that parents have about how they raise their children, have an important impact on children as they grow older. Researchers at the USDA/ARS Children's Nutrition Research Center at Baylor College of Medicine say that these styles also play an important role in the development of children's weight status. Feeding styles are the overall attitudes parents have regarding their children's eating behaviors and food consumption.

In a recent paper published in the journal *Appetite*, researchers studied feeding styles and children's weight. Dr. Sheryl O. Hughes, associate professor of pediatrics at Baylor and the CNRC, was senior author of the study.

They evaluated the effect of four feeding styles: authoritative, authoritarian, indulgent and uninvolved, on children's weight status.

The authoritative style is a child-centered approach in which parents are supportive of their children's individual needs but also set boundaries with them. The authoritarian style is when parents believe that children should do as exactly as they are told and not ask questions. The indulgent style is when parents just want their children to be happy, so they do not set boundaries and uninvolved is when parents are not engaged with their child.

In this study, low-income Hispanic and black parents filled out a questionnaire to determine their feeding styles. Parents also completed a questionnaire on their child's eating behaviors to determine the children's self-regulation regarding eating. Height and weight measures were taken for all children.

Researchers found that indulgent parents have children who have a higher weight status and less optimal eating behaviors. Children of indulgent parents were found to have lower satiety responsiveness and higher food responsiveness, meaning they were likely to continue to eat after they were full, and enjoyed food more than the children of parents with other feeding styles.

"Parents with an indulgent feeding style might expose their children to eating environments that are unfavorable to the development of healthy self-regulation of energy intake and thus the children potentially have a higher risk for obesity," said Hughes.

With this information, researchers are now conducting two additional studies related to eating self-regulation in children. The first study involves giving children tasks to measure eating self-regulation. Researchers are measuring things such as eating in the absence of hunger as well as using a number of tasks that measure children's ability to delay gratification, to look at children's ability to self-regulate. The second study involves intervening with low-income families to teach children to pay attention to internal cues of hunger and fullness and teaching parents that children have the ability to self-regulate their eating.

Others who took part in the study include Leslie A. Frankel of the University of Houston, Teresia M. O'Connor, Tzu-An Chen and Theresa Nicklas of the CNRC and Thomas G. Power from Washington State University.

Funding for this study came from the United States Department of Agriculture and in part with funds from Kraft, Inc.

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DIETARY GUIDELINES CONTINUED FROM PAGE 1

successful, they'll need to reduce barriers and maximize facilitators. A proposed program to implement cooking classes in the Head Start program is a good example of capitalizing on a facilitating factor, Nicklas noted.

David Klurfeld, national program leader for human nutrition at the USDA/ARS, was also involved in the study and emphasized that small changes made over time can help Americans achieve the recommendations of the Dietary Guidelines for Americans. These steps include gradually switching from whole milk to 1 percent or skim milk and switching from refined-grain to whole-grain crackers or switching from white flour bread to a bread made with both whole grain and white flour, and then going to 100 percent whole-grain bread.

For more information on the Dietary Guidelines for Americans, visit <http://www.health.gov/dietaryguidelines/>.

Others who participated in this research and their institutions at the time of the study were Sandra Lopez and Yan Liu, CNRC at Baylor; Lisa Jahns, USDA/ARS Grand Forks Human Nutrition Research Center, Grand Forks, N.D.; Margaret Bogle, formerly with the USDA/ARS Delta Obesity Prevention Research Unit, Little Rock, Ark.; Deirdra Chester, USDA/ARS Beltsville Human Nutrition Research Center, Beltsville, Md.; Maria Giovanni and Kevin Laugero, USDA/ARS Western Human Nutrition Research Center, Davis, Calif.; and Katherine Tucker, USDA/ARS Human Nutrition Research Center on Aging, Tufts University, Boston.

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AMYGDALA RESPONSE

CONTINUED FROM PAGE 1

The researchers looked specifically at amygdala—the brain's key emotion processing region. In mothers with unresolved trauma, they observed a strikingly blunted response on viewing their own baby in distress, compared to comparison mothers.

"This was not the case when mothers viewed pictures of other distressed babies unknown to them," said Strathearn. "We believe that these mothers may, in a sense, be blocking their emotional response to their baby's distress, because of memories of their own childhood trauma."

The mothers' altered brain response may also lead to impaired maternal caregiving behavior, especially when their infants are distressed, which may have long-lasting effects on infant development, Strathearn said.

Strathearn is an associate professor of pediatrics in the section of developmental pediatrics at the USDA/ARS Children's Nutrition Research Center and a co-author on the report. Other co-authors include Dr. Jon Allen, professor in the Menninger Department of Psychiatry and Behavioral Sciences at Baylor and Dr. Peter Fonagy, head of the Research Department of Clinical, Educational and Health Psychology at University College London.

Additional studies are needed for researchers to understand the neurobiological factors that influence parent-child interactions.

The study was funded by the National Institute of Child Health and Human Development.