Study highlights association between obesity and poor episodic memory

Written by Tanya Campbell on 27 Feb 2016

Researchers have noticed that obesity bring changes in brain that may harm memory. It could also influence people to eat more, hence gain even more weight. A small-scale study in England has added to already talked about association between weight and cognitive function and dysfunction in certain areas of the brain.

In the study, the researchers have found participants with higher body mass index performing worse for episodic memory. The theory, said the researchers, is based on previous studies that show obesity has a negative effect on the hippocampus, which involves memory and learning, and frontal lobe, which is involved in decision making, problem solving and emotions.

Dr. Lucy Cheke, a researcher at the University of Cambridge, said that there is a possibility that once a person comes under overweight category, it becomes tough for him/her to keep a track of what and how much has been eaten and that could lead them to overeat.

“The possibility that there may be episodic memory deficits in overweight individuals is of concern, especially given the growing evidence that episodic memory may have a considerable influence on feeding behavior and appetite regulation”, affirmed Cheke.

In the study, the researchers have enrolled 50 participants aged between 18 and 35 having BMI between 18 and 51. They were tested for episodic memory. Out of the total, 26 were having BMI less than 25 and considered lean and 24 had BMI above 25 considered either overweight or obese.

All the participants were asked to complete a computerized treasure hunt by hiding items. They were also given memory tests in which they were required to remember items they have hidden, where and when on the following two days.

Participants with higher BMI could not perform well in the tasks compared to those with lower BMI. Even after including factors like age, years in education and gender, no difference was noticed in performance.

In a report published by the Business-Standard, putting on the extra kilos not only transforms your belly, but also alters your brain, according to a recent study that linked being overweight to poorer memory.
The University of Cambridge research found that overweight young adults may have poorer episodic memory, the ability to recall past events, than their peers, adding to increasing evidence of a link between memory and overeating.

A report published in the VOANews said, "Understanding what drives our consumption and how we instinctively regulate our eating behavior is becoming more and more important given the rise of obesity in society," said Lucy Cheke. "We know that to some extent hunger and satiety are driven by the balance of hormones in our bodies and brains, but psychological factors also play an important role - we tend to eat more when distracted by television or working, and perhaps to 'comfort eat' when we are sad, for example."

"How vividly we remember a recent meal, for example today's lunch, can make a difference to how hungry we feel and how much we are likely to reach out for that tasty chocolate bar later on," she said.

As per the research paper published by the study team, "Increasingly, we're beginning to see that memory - especially episodic memory, the kind where you mentally relive a past event - is also important. How vividly we remember a recent meal, for example today's lunch, can make a difference to how hungry we feel and how much we are likely to reach out for that tasty chocolate bar later on."

"We're not saying that overweight people are necessarily more forgetful," cautions Dr Cheke, "but if these results are generalizable to memory in everyday life, then it could be that overweight people are less able to vividly relive details of past events - such as their past meals. Research on the role of memory in eating suggests that this might impair their ability to use memory to help regulate consumption.

Co-author Dr Jon Simons adds: "By recognising and addressing these psychological factors head-on, not only can we come to understand obesity better, but we may enable the creation of interventions that can make a real difference to health and wellbeing."
The idea that obese people eat too much because they find food more palatable than lean people do has gained support from a new brain-imaging study at the U.S. Department of Energy’s Brookhaven National Laboratory. The study reveals that the parts of the brain responsible for sensation in the mouth, lips, and tongue are more active in obese people than in normal-weight control subjects.

“This enhanced activity in brain regions involved with sensory processing of food could make obese people more sensitive to the rewarding properties of food, and could be one of the reasons they overeat,” said Brookhaven physician Gene-Jack Wang, lead author of the study.

Wang acknowledges that obesity is a complex disease with many contributing factors, including genetics, abnormal eating behavior, lack of exercise, and cultural influences, as well as cerebral mechanisms, which are not yet fully understood. In a recent study, he and his team found that obese people have fewer brain receptors for dopamine, a neurotransmitter that helps produce feelings of satisfaction and pleasure, implying that obese people may eat to stimulate their underserved reward circuits, just as addicts do by taking drugs.

In that study, overall brain metabolism did not differ between obese and normal-weight controls. But because the sensory appeal of food can be so important in triggering the urge to eat, Wang and his team wondered whether obese people might have enhanced metabolic activity in specific brain regions, particularly those involved in the sensory processing of food.
To measure regional brain metabolism, the scientists used positron emission tomography (PET) after injecting volunteers (10 severely obese and 20 normal controls) with a radioactively labeled form of glucose, the brain’s metabolic fuel. Known as FDG, this radiotracer (invented at Brookhaven) acts like glucose in the brain, concentrating in regions where metabolic activity is highest. The PET scanner picks up the radioactive signal to reveal where the FDG is located.

The top images show the brain regions that had significantly higher metabolic activity in obese subjects compared with controls (as measured by PET scans and superimposed on an anatomical MRI image of the brain). The lower images show the same regions with higher metabolic activity superimposed on a homunculus -- a diagram of the somatosensory cortex showing which regions are responsible for sensory input from various parts of the body. The hot spots lie in the areas receiving sensory input from the lips, tongue, and mouth. 

The scientists used a computer program to average the PET data from the subjects within each group, and then compared the obese subjects' average with the normal subjects' result. The program produced three-dimensional images highlighting areas where the obese group had higher metabolic activity than the normal-weight group.

The scientists then superimposed these images onto a magnetic resonance image (MRI) of the whole brain, as well as a diagram of the brain’s somatosensory cortex, known as a homunculus. A homunculus graphically illustrates the relative number of sensory nerves innervating various parts of the body as well as where the input from these nerves is received on the somatosensory cortex.
The overlapping images revealed “hot spots” — indicating obese subjects’ higher metabolic activity — in the regions of the parietal cortex where somatosensory input from the mouth, lips, and tongue is received. This is also an area involved with taste perception.

“The enhanced activation of these parietal regions in obese subjects is consistent with an enhanced sensitivity to food palatability, which is likely to increase the rewarding properties of food,” Wang said.

Taken together with the earlier results on deficient reward circuits, this enhanced sensitivity could account for the powerful appeal and significance that food has for obese individuals.

The findings also suggest that pharmacological treatments known to decrease palatability might be useful along with behavioral therapies in reducing food intake in obese subjects.

**Brain Imaging – Childhood Obesity and the Long Term Success of Treatment Procedures**

Childhood obesity and related long term effects are serious public health problems, but not all children do well in obesity treatment. In collaboration with Dr. Ellen Schur at the University of Washington, the Roth lab is testing a new theory that the brain does not appropriately suppress appetite after a meal in obese children through the use of functional neuroimaging. In conjunction with Drs. Elizabeth Aylward (CIBR), Brian Saelens (Center on Child Health, Behavior, and Development), and Thomas Grabowski (Department of Radiology, UW), we are also testing if this brain function affects children’s response to obesity treatment. Based on the results, future studies will refine treatment procedures, developing and testing alternate strategies for obesity treatment in children.
SUGAR FED BAD BACTERIA IN THE GUT CAN TAKE OVER YOUR BRAIN LIKE AN ALIEN PRESENCE
If the EEG is Too Slow The Educator will Speed it Up

If the EEG is Too Fast The Educator will Slow it Down

The SCIO/Educator/Eductor Technology can Find an Energetic Problem and Promote Healing

EWH=Electro-Wound-Healing

Electrical Current Flows Through Healthy Tissue in a Predictable Way

The Educator Can Tell if there is Healthy or Injured Tissue

Inflamed Tissue has a different pattern from Degenerate Tissue

Electrical Current Flows Different Through Injured Tissue

The Educator can then Give an Electro-Therapy-Pulse To Promote Healing

The Educator Can Measure and Treat Both Diseased Tissue
Enthusiasm and Awareness are the Best Weight Loss Methods

Biofeedback makes you Aware

As Patients learn the Causes of Weight Gain and then they Learn the Way to Reduce it. Improving Life with Exercise, Diet, Herbs, Networking, Stress Reduction, and other Natural Therapies Patients can Learn to Help Themselves by accepting Responsibility increasing Awareness and thus Enthusiasm
Biofeedback is a Part of Medicine

The key word at the Heart of Biofeedback Medicine is "RESPONSIBILITY". From the first moment the Therapist does a Lifestyle inventory of the Behaviors that can Suppress and or Obstruct the Natural Curative force in a Patient's Body until the end Biofeedback Therapy shows that the Patient can indeed Control their Body with their Consciousness and Will Power, the Whole and Wholistic Biofeedback Process Instills "RESPONSIBILITY".