UCI | CENTER FOR DIABETES TREATMENT AND RESEARCH

CenterNews

Fall 2008

Researcher Uses Laser to Detect Diabetes-Related Vascular Changes

UC Irvine laser technology may hold the key to an effective non-invasive outpatient tool for screening and monitoring those at risk for cardiovascular complications

Diabetes is associated with significant risk of nerve damage and cardiovascular disease, which is the leading cause of mortality in patients with type 2 diabetes. At present, there is no easy and reliable non-invasive method for monitoring the microvascular (small vessel) changes that precede these complications. In an effort to develop such a tool, medical student Lauren Sundheimer is conducting a pilot project using laser light rays to detect these microvascular changes.

A partnership between the Center for Diabetes Treatment and Research, and the Beckman Laser Institute, the study uses an existing laser technology developed here at UC Irvine, called Diffuse Optical Spectroscopy (DOS), and could lead to a non-invasive clinical method to screen for early signs of microvascular changes that can occur in patients with diabetes. DOS is very sensitive at detecting tissue damage and perfusion (circulation), and already has shown promise in the field of breast cancer.

Second-year medical student, Lauren Sundheimer

Prior to entering medical school, Sundheimer worked with a local endocrinologist as a research coordinator involved in diabetes, neuropathy, cholesterol, blood pressure, obesity and other related clinical trials, where she observed the connectedness and commonality of these conditions. She received a Master's degree from UC San Diego in transduction, a process by which biological cells convert one type of signal or stimulus into another.

"Personally, the diabetes research is important for my understanding of the disease pathology so that I can better serve and treat patients in the future," said Sundheimer, who is in her second year at the UC Irvine School of Medicine. "It also has personal significance as my family has a history of diabetes. My great grandmother was a diabetic in the days before they had insulin and the effective treatments they now have today," she continued.

Read more about this study at www.ucidiabetes.org (click on "Research").

What's NEW?

Legislation

In mid-July, congress overturned the presidential veto on extending special diabetes funding. The approved bill extends funding for special diabetes programs by $300 million over two years.

CGM Insurance Coverage

Some insurance companies have begun to cover the cost of continuous glucose monitoring (CGM) equipment for patients that meet certain criteria. To be covered, people with diabetes must be pregnant, or experience severe hypoglycemia. Especially serious is a condition known as hypoglycemic unawareness (HU), in which the patient does not feel the symptoms of low blood sugar coming. CGM delivers blood glucose readings every five minutes and can be set to alert its wearer with an alarm before blood sugar levels get too low. Having this type of device can be useful for heading off high blood sugars as well. CGMs on the market today include the Medtronic Guardian REAL-Time CGMS, the Dexcom SEVEN System and the Abbott Freestyle Navigator.

Participate in this Study

If you or someone you know meet the criteria and would like to participate in the laser study described above, please contact:

Lauren Sundheimer
E-mail: lsundhei@uci.edu or
Phone: (949) 292-0915

We are recruiting patients in the following categories:

- Type 2 diabetic and Metabolic Syndrome patients;
- Non-diabetic relatives of Type 2 diabetes patients
- Long-term Type 1 diabetics with history of diabetic peripheral neuropathy;
- **Control Group**

First Person:
Pregnancy and Type 1 Diabetes

Having diabetes adds many complexities and challenges to pregnancy, but with new advances in blood glucose monitoring and a supportive health care team, a positive outcome is possible

Jeremy, Hannah and Suzie Won Speizer

As a type 1 diabetic of 27 years, I have had some of the disease's most feared complications — loss of vision and kidney and nerve damage — brought on by years of teenage rebellion that included skipping insulin shots and blood tests. Due to my history, having a baby would be very risky both to my health and that of the fetus. Yet, I always knew that I wanted to be a mother someday.

When I found out that I was pregnant, my diabetes was not under control, which put me at greater risk for developing preeclampsia, a condition that can lead to liver damage, kidney failure and even death. My doctors were encouraging, but I was afraid and I knew that carrying a baby to term would be the greatest responsibility I'd ever faced — as if diabetes itself wasn't challenging enough.

At my first ultrasound, the technician confirmed the date of conception and showed me the embryo's strong and healthy heart beat. My happiness was tempered by worries that diabetes would harm the baby growing inside me. The incidence of fetal malformation is higher in diabetic women. Jeremy, my husband, also was very concerned but remained supportive through the entire process. I learned that at full term, our baby was due on March 28, which is one day after my birthday. I had chosen only one name and it was a girl's name: Hannah. As the stars would have it, I later learned, we were going to have a baby girl.

In *utero*, a baby's pancreas produces insulin in response to its mother's blood sugar levels. If mom's blood sugar is high, the baby produces more insulin, which doesn't affect mom, but makes the baby grow larger and more likely to develop future metabolic issues. Therefore, it was absolutely critical for me to maintain as close to normal blood sugars as possible. For someone who has never had very tight control, I was more compelled than ever to manage my diabetes. Through a low-carbohydrate diet, insulin adjustments and the help of the Dexcom SEVEN continuous glucose monitor, which I got here at the clinic, I rapidly brought my blood sugars down to the normal range, with a record low A1c of 5.3!

Throughout my pregnancy, I had an overwhelming sense of well-being. I did not experience the symptoms of pregnancy — morning sickness, heartburn and swelling of the extremities — save for a few exceptionally painful headaches. My blood sugars were under tighter control than ever. Still, my doctors were extremely cautious and required frequent visits — every two weeks in the first six months, then fetal monitoring twice a week in the last trimester. Our baby was at a higher risk of developing congenital defects such as spina bifida, or malformation of the spinal column. Even more terrifying was the increased risk of still birth. To reduce this chance, doctors typically don't let diabetic pregnancies go full term.

Hannah came into this world on March 17, 2008, (St. Patrick's Day) with Celtic music playing in the operating room. Maybe it's the luck of the Irish, but we escaped some of the horrible effects that uncontrolled maternal diabetes can have on an unborn baby. Hannah is a healthy baby, weighing six pounds, four ounces at birth, with healthy organs and a fully developed spine. I was so relieved and excited about this little miracle, that I stayed awake that first night in the hospital room just staring at her. In the process of giving her life, Hannah has given me the best nine months of diabetic control, and a reason stronger than any, to take better care of myself so I can watch her grow for years to come.

Director's Message

On behalf of the Diabetes Center, I am pleased to share with you our newly designed and formatted quarterly newsletter. We hope that you enjoy the articles and find the information useful. By "going green" and signing up to receive our newsletter via e-mail you can help us conserve resources.

More than half way through the year, 2008 has been a time of achievements for the Center and a time of challenge for the diabetes community. The Center has gained recognition for quality and clinical excellence from the National Committee of Quality Assurance. Recently, we developed a new outreach educational program for the employees of Orange County corporations, and our scientists are conducting trail-blazing research to understand the mechanisms of diabetes and its complications. In the next two months, we will initiate an innovative telemedicine program to provide diabetes care and education to those patients living in remote areas with little or no access to quality diabetes care. The Center continues to recruit new faculty and is planning for a major improvement of our research facility.

Nationally, we are facing a deteriorating health economic climate, dwindling research funding from the federal government, and a worsening of the diabetes epidemic. These challenges also present opportunities for the Center as we continue to build on our past achievements and rise to meet new challenges. Lauren Sundheimer's research, featured on the cover, is just one example is how we foster the next-generation of diabetes research, enabling us to serve our community and to fulfill our mission of beating diabetes through patient care, research and education.

Ping H. Wang, MD
Center Director

UC Irvine Center for Diabetes Treatment and Research

Our Mission

A center of integrity and responsibility dedicated to preventing diabetes, improving care and advancing science to find a cure.

Contributors

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www.ucidiabetes.org

Celebrate the Center!

Come and enjoy an evening with the Center's friends to celebrate the center's accomplishments and to raise funds for research to prevent and cure diabetes. Enjoy Italian fare and wine, a silent auction and an update on the next-generation of diabetes research.

The evening's festivities will include:
- Next-generation diabetes research and new technologies update
- Silent auction featuring luxury and entertainment items
- Wine pairing with Italian fare

Your participation in this event will assist the Center in its mission to serve as a center of integrity dedicated to preventing diabetes, improving care and advancing science to find a cure.

Wednesday, Sept. 17, 2008
6:00 p.m. to 9:00 p.m.
Prego Ristorante
18420 Von Karman
Irvine, CA 92612
www.pregoristoranti.com

RSVP by Sept. 12
To: Rebecca Ford
Development Assistant
UC Irvine (949) 824-1677
Tickets are $100.00 each
www.ucidiabetes.org

Reducing Chronic Inflammation

Chronic inflammation has been linked to diabetes, weight gain, heart disease, cancer and Alzheimers disease. What is it and what can we do about it? Inflammation is something we think about when we have an infection or our arthritis 'flares up.' We take aspirin, ibuprofen or NSAIDs to reduce inflammation and the fever or pain it is causing.

Chronic inflammation is more subtle. We don't feel any different, but our body is still reacting to the condition. A blood test that measures C-reactive protein can help identify the condition.

There are natural ways to reduce chronic inflammation. Including a variety of fresh fruits and vegetables, fish, olive oil and certain herbs and spices and avoiding processed sugars and highly refined starches in your diet can help reduce inflammation. Here are some tasty suggestions for boosting your intake of anti-inflammatory foods.

Fresh Menu Ideas

- *Grilled wild salmon (or other cold-water fish filet)*
- *Grilled asparagus spears, drizzled with 1 tsp olive oil*
- *Grilled whole grain French bread slices rubbed with fresh garlic*
- *Mixed salad greens with grape tomatoes and pecan halves, dressed with olive oil and vinegar*
- *Mixed berry cup with light nondairy whipped topping*
- Iced green tea

Foods That Fight Inflammation

- Fish, especially wild salmon
- Grass-fed beef & poultry
- Olive oil or other cold-pressed oils
- Salad veggies, greens, tomato
- Cruciferous vegetables
- Cherries, blueberries, kiwi
- Turmeric (ingredient in curry)
- Ginger
- Garlic
- Green Tea

Go Green!

Help us save resources by opting to receive our quarterly newsletter online. Visit www.ucidiabetes.org and sign up with your e-mail address.

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