

Juvenile diabetes (type 1 diabetes) march 17, 2013

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Juvenile Diabetes (Type 1 Diabetes) March 17, 2013 Diabetes was first discovered as far back as 6th century BC by an Indian physician Sushruta. He recognized that people showing certain symptoms all had sweet urine. He called this condition Madhumeha. In 1869 a young medical student in Berlin named Paul Langerhans was interested in learning about the structure of the pancreas. He discovered there were clumps of tissue clustered in the pancreas. Langerhans never learned the function of this tissue. These cells became known as the Islets of Langerhans. He never realized he would be associated with who discovered diabetes. Langerhans' son, Archibald, and another man, Edouard Laguesse, later thought these clusters of cells might secrete something that helped regulate digestion . In 1889 Oscar Minkowski, a Polish-German physician, along with Joseph von Mering wanted to understand more about the role of the pancreas in digestion. They removed the pancreas from a dog to study it. Several days later, a lab technician noticed that flies swarmed the area where the dog had urinated. Minkowski and von Mering tested the urine and found sugar. This was the first link between the pancreas and diabetes. In 1901 Eugene Opie confirmed that the Islets of Langerhans and diabetes were connected. He is quoted to say, " Diabetes mellitus... is caused by destruction of the islets of Langerhans and occurs only when these bodies are in part or wholly destroyed. " So now the medical community knew that the pancreas, particularly the islets of Langerhans, was not functioning in a person with diabetes. For the next 20 years, the discovery of insulin evaded those who researched the pancreas. 1906 George Ludwig Zuelzer was able to extract some secretions from the pancreas. He had some success treating dogs. But he couldn't get support to

continue his work. Juvenile diabetes (type 1 diabetes) is usually diagnosed in children and adolescent. It occurs when the pancreas is unable to produce insulin; insulin is a hormone that controls the amount of glucose in the blood. Approximately 10 per cent of people with diabetes have type one diabetes. Diabetes is serious if left untreated or improperly managed. Diabetes can result in a variety of complications, including heart disease, kidney disease, eye disease, problems with erection (impotence), nerve damage, frequent urination, extreme thirst and dry mouth, weight loss, gain, increased hunger, frequent or recurring infections, cuts and bruises that are really slow at healing and tingling or numbness in hands and feet. Symptoms of juvenile diabetes can develop quickly, over weeks or even days. Other symptoms include itchiness around the vagina or penis, or regular yeast infections, blurred vision that is caused by the lens of your eye changing shape, cramps, skin infections, a strong, fruity breath odor, and rapid, deep breathing. When you have type one diabetes your blood glucose levels can become very low. This is known as hypoglycemia (or" hypo"), and happens because any insulin in your body has moved too much glucose out of the bloodstream. In most cases, hypoglycaemia occurs as a result of taking too much insulin, although it can also develop if you skip a meal, exercise very vigorously or drink alcohol on an empty stomach. If hypoglycaemia is not controlled it can lead to confusion, slurred speech and unconsciousness. If this occurs, you will need to have an emergency injection of a hormone called glucagon. This hormone increases the glucose in your blood. Diabetes is treated if people that have it can expect to live active, independent and vital lives if they make a lifelong commitment to careful diabetes

management, which includes the following: Education: Diabetes education is an important first step. All people with diabetes need to be informed about their condition. Physical Activity: Regular physical activity helps your body lower blood glucose levels, promotes weight loss, reduces stress and enhances overall fitness. Nutrition: What, when and how much you eat all play an important role in regulating blood glucose levels. Weight Management: Maintaining a healthy weight is especially important. Medication: Type 1 diabetes is always treated with insulin. Lifestyle Management: Learning to reduce stress levels in day-to-day life can help people with diabetes better manage their disease. Blood Pressure: High blood pressure can lead to eye disease, heart disease, stroke and kidney disease, so people with diabetes should try to maintain a blood pressure level at or below 130/80. To do this, you may need to change your eating and physical activity habits and/or take medication. Diabetes kills about 4 million people every year around the world and is the seventh leading cause of death in the U. S. In 2006 diabetes was attributed to approximately 72,500 deaths in the U. S and also listed as the seventh leading cause of deaths listed on U. S death certificates. Diabetes can result in multi-system complications including heart disease, kidney disease, blindness, peripheral vascular disease and neuropathy. In 1920, a Canadian surgeon Frederick Banting reviewed the earlier work of Minkowski. He believed the digestive secretions in the pancreas were breaking down the secretions of the islets. Banting felt whatever the pancreas secreted was controlling sugar in the blood. He hoped he could capture the secretions and use it as a treatment for diabetes. His plan was to tie off certain arteries to the pancreas. He

thought this would kill off most of the pancreas that produced the digestive secretions. That would allow him to extract only the secretions of the islets of Langerhans, now all he needed was a lab to test his theory. In early 1921 Banting asked J. Macleod, a professor of physiology at the University of Toronto, if he could use his lab space over the summer break to carry out his research. Although skeptical, Macleod let Banting use his lab for the summer. He even offered 10 test dogs and 2 lab assistants. Banting could only afford one lab assistant. Charles Best was the fortunate winner of a coin toss for the position. Banting and Best followed Banting's proposed technique and tied off the pancreatic duct of a dog. It took several weeks before the digestive cells in the pancreas died off. Now they had just the islets of Langerhans to work with. They took the secretions from the islets. They called it isletin (later to be called insulin). Banting and Best knew they could mimic the symptoms of diabetes in the test dogs if they removed the pancreas. The dogs would start to show the symptoms seen in humans which led to a coma, and eventually death. They injected isletin into these dogs. They found the symptoms would subside after the injections. Banting and Best had found a treatment for diabetes! In the fall of 1921 the preliminary research intrigued Macleod. He felt their work needed to be repeated in a more controlled environment. He set up Banting and Best in a better laboratory with better equipment. They were also given more dogs to see if they could repeat the success of their first experiments. Their success was repeated. Macleod helped get their results published. On January 11, 1922 a 14-year-old boy named Leonard Thompson was the first human to be injected with isletin. Leonard suffered a severe allergic reaction because of

the impurities still in isletin. Collip went back to work to further refine isletin, January 23, 1922 just 12 days later; Collip had reworked his refining process to remove impurities. Leonard received a second injection of the improved insulin. He showed no negative reaction. He DID show signs of improved health. Leonard lived another 13 years using insulin injections. Leonard became famous by these researchers who discovered diabetes. One of the most unnerving things I learned was how children with juvenile diabetes were treated. Once a child started showing symptoms, he/she was kept in a ward with up to 50 other kids diagnosed with diabetes, because there was no treatment, the kids were in various stages of diabetic ketoacidosis. Many may have fallen into comas. Families would visit knowing their child was going to die. After the success with Leonard Thompson, Banting, Best and Collip went to one of these wards. They gave injections to each child, one-by-one. Tiffany Watson