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MINI REVIEW

DIABETES – A HISTORICAL REVIEW

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ABSTRACT

Diabetes has been known for last 3500 years. Different cultures and systems of medicine describe this disease in their own way. This article gives an overview regarding historical aspects of diabetes mellitus. This article also compiles the development in the field of diabetes mellitus in chronological order.

Keywords: Diabetes, Madhumeha, Insulin

INTRODUCTION

Diabetes has been recognized for last 3,500 years. The ancient Egyptians knew it very well, as documented in the Ebers Papyrus[1]. Fifteen hundred years later, Aretaeus (130–200 CE) used the term diabetes (from the Greek for *siphon*), and accurately described the signs and symptoms of diabetes[2]. The term diabetes was coined by Aretaeus of Cappadocia. It was derived from the Greek verb "diabaínein", itself formed from the prefix "dia"-, "across, apart," and the verb "bainein", "to walk, stand." The verb "diabeinein" meant "to stride, walk, or stand with legs as under"; hence, its derivative "diabētēs" meant "*one that straddles*," or specifically "a compass, siphon." The sense "siphon" gave rise to the use of "diabētēs" as the name for a disease involving the discharge of excessive amounts of urine. Greek and Roman physicians used the term "diabetes" to refer to the conditions in which the cardinal finding was large volume of urine. In Vedic medical treatises from ancient India identified and classified it as *madhumeha or honey urine*. The ancient Indians tested for diabetes by observing whether ants were attracted to a person's urine, and called the ailment "*sweet urine disease*" (Madhumeha). Also, the Indians noticed the relation of diabetes to heredity, obesity, sedentary life and diet. They suggested the freshly harvested cereals and bituminous preparations containing benzoates and silica as a remedy for diabetes[3]. The first time association of polyuria with a sweet-tasting substance was reported in the Indian literature from the 5th-6th century BC by Sushruta (a notable Indian physician) [3]. Type 1 and type 2 diabetes were identified as separate conditions for the first time by the Indian physicians Sushruta and Charaka in 500- 600 BC with type 1 associated with youth and type 2 with being overweight[4]. In course of time, two distinct types of diabetes were recognized – One was diabetes mellitus in which urine was tasted sweet and another was diabetes incipidus in which urine was watery but not sweet. The word diabetes is generally used as a synonym for diabetes mellitus.

The modern era in the history of diabetes started with the rediscovery of Thomas Willis in 1675 of sweetness of urine of diabetic patients[5]. Willis, who was a physician at Guy's Hospital in London, United Kingdom, stated unequivocally that the diabetic urine is *"wonderfully sweet as if it was imbued with honey or sugar"*. He added the Latin word mellitus, literally meaning honey sweet to the Greek diabetes to describe the disease. But Willis could not attribute this urine sweetness to presence of sugar. Four years later, Frank classified the disease, on the basis of presence of sugar-like substance into diabetes *insipdus* (tasteless urine) and diabetes *vera* (sweet urine) [5]. Further in 1775 diabetes was described by Dobson and demonstrated by the presence of sugar in the urine[6]. Von Mering and Minkowski in 1889 discovered that pancreactomized dog becomes diabetic in addition to developing digestive disturbances[7]. The nondigestive part of pancreas, islet cells, was thought to be responsible for substance which prevented diabetes and was christened *'insulin'* by de Mayer (1909), long before its extraction by Banting and Best in 1921[8]. Hypoglycemic action of sulfonamide was discovered by Janben (1942) and confirmed by Frank and Fuchs in 1955[9]. Since then many oral hypoglycemic agents have been introduced in therapy.

Important Landmarks in History of Diabetes Mellitus:

1552 BC: Egyptian physician Hesy Ra of the 3rd dynasty made the first known mention of a rare disease – Diabetes

600 BC : Sushruta described diabetes (*Madhumeha*)

130–200 BC: Great Aretaeus, Greek physician was first to give diabetes its proper name.

131-201 AD: Galen and Avicenna provided description of disease.

1675: Dr. Thomas Willis adds the word 'mellitus', Latin for 'honey'

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1776: Matthew Dobson, described presence of glucose in urine.

1848: Claude Bernard – first linking of diabetes and glycogen metabolism, established the liver's role as a vital organ in diabetes.

1869: Paul Langerhans discovered the islet cells of pancreas.

1871: Apollinaire Bouchardat formulated individualized diet to treat the condition.

1912: Scott observed high blood sugar in pancreactomized rat.

1910: Sir Edward Albert Sharpey- Schafer named the harmone produced by islets of langerhans as insulin from the latin for " *island* ".

Dec. 1916: Dr. Joslin - purposed treatment of diabetes with diet and exercise.

1921-1922: Banting and Best published their first paper on *"The internal secretion of pancreas"* demonstrating that insulin could abolish ketosis and stimulate glycogen formation in the livers of diabetic dogs.

March 1922: Banting and Best published their paper on *"Pancreatic extracts in the treatment of diabetes mellitus"*

January 1922: Leonard Thompson became first person to receive an injection of insulin to treat diabetes.

May 30, 1922: Eli Lilly & Co. of Indianapolis and the University of Toranto entered into a deal for mass production of insulin.

Oct. 25, 1923: Banting and Macleod are awarded the Nobel prize in Physiology or Medicine. Banting shares his award with Best, while Macleod shares his with Collip.

October 1923: Insulin was made commercially available in United States and Canada.

1924: First Insulin syringe was manufactured.

1955: Amino acid sequence of insulin was discovered by biochemist Frederick Sanger.

1958: First oral drug for diabetes – Sulfonylurea was discovered by Janbon and Colleague.

1959: Sterne confirmed sugar lowering property of metformin.

1966: First pancreatic transplant done at university of Minnesota.

1971: Anton Hubert Clemens an engineer patented blood Glucometer.

1982: First insulin analogue using recombinant DNA technology was produced by Eli Lilly Pharmaceuticals.

1990: Pioglitazones were introduced.

1999: First successful islet transplant done at university of Alberta hospital

2005: FDA approved first GLP 1 analogue Exenatide, later in 2010, FDA approved liraglutide for treatment of diabetes mellitus.

2006: First DPP-IV inhibitor sitagliptin was approved by FDA.

2009: Bromocriptine was approved by FDA for treatment of diabetes mellitus.

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