

A REVIEW OF THE HISTORY OF *PRAMEHA* AND DIABETES MELLITUS

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ABSTRACT: *Several diseases of polyuric nature were described in Ayurveda. Collectively called Prameha, this group includes an entity called Madhumeha which is the equivalent of diabetes mellitus. The medical history of the two diseases is described in the article.*

INTRODUCTION

Prameha is a disease well known since vedic periods. The development of scientific knowledge has brought about a great change in the understanding of pathology and management of this disease. Charaka Samhita and Sushruta Samhita served as the ancient medical compendia for the early detection and treatment of this disease. The biochemical tests which help the modern physician to diagnose the disease are of quite recent origin. Till they become available, the physician had to rely on simple observation of the patients excretions and in the very distant past his sense of taste led to the recognition of the disease characterized by the passing of large amounts of very sweet or honey like urine. The ancient Indian literature of the pre-Christian era has distinctly recorded the most important symptoms of this disease as thirst, excretion of sweet urine and loss of weight.

The word *Prameha* literally means “to flow” which is derived from the Sanskrit root “Mih-Sechane”. The Sanskrit term *Meha* literally means to micturate. The verbal *Mehanam* signifies urination. It (*Prameha*) is qualified by prefix “Pra” meaning excess

both in quantity and frequency. According to Sushruta and Vagbhata, *Prameha* is characterized by copious flow of cloudy or turbid urine, although the turbidity of urine varies from type to type depending upon involvement of doshas and dhushyas in varying proportions^{2,3}.

Charak has traced the origin of *Prameha* from an incident of the disruption of “Yagya” conducted by Daksaprajapati. He states that *Prameha* first occurred by overeating of “Havish” (contains much of carbohydrates & fats), a special type of food offered in this “Yagya”.

The description available in Atharvavedha is considered as the first ever on this topic, and is mentioned in Kaushikasutra. Sayana and Kesavabhata, the well known commentators of the Sacred Vedas interpret ASRAVA as ‘Mutratissara’. The above reference from Atharvavedha is described by Krambilkar (1961) as the term Asrava is variously interpreted. The term is formed from the root a + Sr meaning to flow. Whitney (1962) interpreted this as flux and Giffith (1962) as morbid flow. Some have included conditions like atisara (diarrhea),

Mutratisara (excessive flow of blood – meaning conditions associated with menstrual flow). Sayana and Kesavabhata, commentators of Vedic works included Mutrasrava (excessive urination) under Asrava.

Whitney has described (1962) the meaning of the reference “as between both heaven and earth stands the bamboo (tejana), so let the reed stalk (Munja) stand between the both diseases and the flux (asrava). The commentator glosses tejana with venu, for asrava the commentator explains it hereby mutratisara, difficulty of urinating or painful urination.

Another important reference is also available in Kausikasutra of Atharva Veda. The Ancient Ayurvedic classics which ensued the Vedic period bear ample clinical description on this disease. According to the above clinical description it is indicated that the ancient physicians of India were aware of the presence of sugar in blood and urine.

Brief outline to the history of diabetes and the events:

Although references to diseases that could have been diabetes mellitus occur in many ancient writings, there can be no doubt that Aretaeus (Second century A.D) was very familiar with the clinical picture. The description of diabetes emphasizes what dreaded disease it was, before the availability of Insulin.

Aretaeus understood quite clearly that ingested food was not assimilated and that the tissues of the body were consumed and passed out with the urine.

It was 1400 years later that Thomas Willis (1621 – 1725) detected the sweet taste of urine and further 100 years before Matthew

Dobson (? – 1784) showed by a series of elegant experiments, that the urine from uncontrolled diabetics contain sugar, that the sugar in the urine originated from the blood and that when the symptoms of the disease were removed by the treatment sugar disappeared from the urine (Major, 1948).

The pancreatic origin of diabetes had already been discovered; Johann Conrad Brunner (1653 – 1727), a Swiss anatomist, famous for discovering the glands in the small intestine that bear his name, removed the pancreas from several dogs and noticed that at least one developed a diabetic syndrome. (Brunner, 1683) – That if frequently passed water on account of the large amount of urine that it was producing. He also comments on similar studies performed by the Perspicacious Malpighide Sauvages (1752) again refers to the experiments performed by Malpighi that resulted in the artificial production of diabetes. Later on Johann Peter Frank (1745 – 1821) classified the disease into Diabetes Mellitus and Diabetes Insipidus. And it was Cawley (1778) who linked the disease with the function of pancreas. The sugar that is excreted through the urine was named as grape sugar (Cherul – 1815). In 1848 Fehling established the presence of reducing sugar in urine of diabetics.

Like so many events in research, these fundamental observations were too premature and were not pursued. It was two hundred years later that Minkowski and Von Mering removed the pancreas from a dog in order to settle an argument between them as to whether or not the animal could survive without it (Major, 1948). Minkowski found that the animal developed a full-blown diabetic syndrome and passed copious urine containing five to eleven percent glucose – without the animals having received any nourishment what so ever. Minkowski and

Von Mering's findings suggested that the pancreases produce something, the lack of which leads to the development of diabetes. Langerhans noticed on a cut pancreas, 1869, the islets that now bear his name (Papaspuros, 1952).

Opie in 1900 reported hyalinization of these islets in patients dying with diabetes. Diamare in 1899 described the presence of two types of cells in the islets; these were named the A and B cells by Lane in 1907. Bayliss and Starling, working at University College Hospital, London, had introduced the word 'HORMONE' in 1897, and introduced the concept of chemical messengers. The name 'Insuline' was given to the still hypothetical islet hormone by Schaffer, who was so prophetic that he named Pro-Institute as well (Schaffer, 1916).

In 1913 Homans suggested that insuline was secreted by the B cells of the Islet of Langerhan's (Papaspuros, 1952). The treatment of diabetes, at this time, was largely confined to various forms of starvation diets. Between the beginning of the Century and 1921 there were many attempts to Isolate the active principle from the pancreas.

F M Allen, the famous diabetic specialist from Boston, made a pancreatic extract that, when injected into normal animals, led to the appearance of sugar in the urine. He wrote at that time (1113), all authorities are agreed upon the failure of the pancreatic therapy in Diabetes (Wrenshall Hetenyi and Feasbj, 1962). At about this time Murlin and Kramer, two American Physiologists, pointed out that to be successful, any active principle from the pancreas must increase the respiratory quotient as well as eliminate the glycosuria.

The partnership of Banting and Best which started in May 1921 and which led to the successful isolation and use of insulin in the treatment of diabetes, initially in a dog (Nov. 1921) and subsequently in a human (Jan. 1922) is one of the best known stories from medical history. Leonard Thompson was a 14 years old boy in the wards of Toronto General Hospital where diabetes had been slowly progressing since Dec. 1919. By Jan 1922 he was very weak and not expected to live much longer. On 11th Jan. he was given the first injection of pancreatic extract.

The name diabetes, which is derived from the Greek for siphon, was given to the disease by Aretaeus of Coppadocia (81 – 138 A.D). The objective mellitus which comes from the Latin for honey was added by Thomas Willis in 1674.

The etiology of diabetes mellitus is a controversial subject. Diabetes like hypertension is not a single disease entity, and its etiopathogenesis is likely to involve the interplay of a host of factors. It is generally agreed that this metabolic disorder results from an absolute or relative deficiency of insulin. Pancreatic beta cell activity and the insulin requirement of the individual are in a state of dynamic equilibrium under physiological condition. Normally the beta cells can cope with large demands for insulin in the maintenance of metabolic homeostasis. However, I the presence of structural or functional disorders of the pancreas, the beta cells may not be able to meet even the minimum daily requirement of insulin (absolute deficiency). In some instances, the beta cells may produce insulin which is inadequate to meet unusually large Demas (relative deficiency). The relative deficiency of insulin may also be due to anti-insulin antibodies; making the

secreted hormone unable to function normally.

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