DIABETES. MELLITUS AND INSIPIDUS

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ANDREW H. SMITH

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PREFACE.

The object of this little work is not to compress into the fewest possible words all that is known or surmised in regard to Diabetes, but to give the points which will most interest those who have to manage cases of this disease. Consequently, but little space is given to the discussion of undetermined questions of physiological and pathological chemistry, etiology, etc. Those who wish to go deeply into these matters will find in the literature of the subject a mass of facts and theories from which they may form their own opinions.

The writer has endeavored to reflect his own experience in the pages of what in the nature of the case must be largely a compilation. It is hoped that the reader, if he finds nothing new in them, will at least find something practical and helpful.

In their preparation much use has been made of the admirable article by Dr. Tyson, in Pepper's System of Medicine, and also of his compendium of the literature of Diabetes in the Annual of the Universal Medical Sciences for 1888 and 1889. From these sources and the references they give it is possible to trace back to nearly everything that has been written on Diabetes, and Dr. Tyson has laid all who shall write hereafter on the subject under lasting obligations.

DIABETES (MELLITUS.)

CHAPTER I.

CLINICAL HISTORY AND COMPLICATIONS.

Leaving out of consideration the conditions in which sugar appears transiently in the urine in the course of various affections, or as the result of special articles of diet, the term *Diabetes* will be restricted to the designation of that form of disease of which saccharine urine is the leading and persistent feature. With the unnatural quality, is usually, though not necessarily, associated increased volume of the urine.

The limits of this work will not permit a detailed statement of the many interesting and ingenious researches into the nature of this affection which have occupied so much attention during the past quarter of a century. As the result of these investigations, however, we seem warranted in accepting as proven that the seat of the sugar formation is the liver; that under the influence of disordered nervous action the physiological function of the liver as a sugar produc-

ing organ is enormously increased; while at the same time the consumption of sugar in the economy is diminished; and that in consequence sugar accumulates in the blood, whence it is excreted by the kidneys.

In most cases the attention of the patient is first attracted by observing that the calls to urinate are unduly frequent, and that the quantity of urine is greater than the normal. It may also be noticed that the urine imparts a peculiar stiffness to any fabric upon which it has dried. Sometimes the first intimation of the disease is conveyed by eczema of the prepuce or labia, caused by the irritation of the saccharine urine.

Very early in the case an abnormal thirst is observed. This becomes more and more urgent in proportion as the quantity of urine increases, until the patient is scarcely ever free from its importunity. Throughout the day large and frequent draughts of water are taken, and at night, between calls to evacuate the bladder and attempts to assuage the thirst, the sleep is broken and unrefreshing, thus adding another to the exhausting influences of the disease.

Along with the thirst is developed a dryness of the mouth, amounting in some instances to a burning sensation; at the same time the patient is conscious of a sweetish, fruity taste. The breath has also a sweetish, slightly etherial odor.

In most cases the appetite is increased, and the

amount of food taken is sometimes enormous. Yet, although the digestion may remain for some time unimpaired, there is loss rather than gain in flesh. The emaciation may become extreme. In some instances it is the first symptom which excites attention. That the tissues should waste rapidly and to an extreme degree, is the natural consequence of the excessive drain upon the system, not only in the amount of sugar excreted, but in the excess of urea which usually accompanies it. The sugar being produced at the expense of the principal fat-producing elements of the food, the adipose tissue suffers more in proportion than the muscular fibre. The exclusion of starch and sugar from the diet as a measure of treatment, of course operates in the same direction. But the nitrogenous elements of the body suffer also, contributing ultimately to the production of sugar, while the urine contains an abnormal proportion of azotized principles, as will be more fully considered hereafter.

This loss of flesh causes the skin of the face to become wrinkled. The surface of the body is generally dry and harsh, often furfuraceous. The contact of the urine may occasion eczema of the genitals, especially in women, and this may go on to excoriation, and occasionally to ulceration or gangrene.

In the advanced stages impotence is not uncommon.

The digestive organs very generally show signs

of derangement. Flatulence and eructation indicate that digestion is slow, allowing time for fermentation of the contents of the alimentary canal. Gastric uneasiness is present, and the bowels are often obstinately constipated.

The enormous loss of the materials from which heat is produced, and the general disturbance of the processes of assimilation and disassimilation, together with the large amount of fluid taken into the system at a temperature lower than that of the body, result in a marked reduction of the bodily heat. In uncomplicated cases, this is proportionate to the gravity of the disease. In mild cases the temperature will range from 97° to 98°; in severe cases it may fall as low as 93°, or even lower. In this condition an affection usually accompanied by hyperpyrexia, as for example, pneumonia, may run its course without bringing the temperature up to its normal standard.

Anæmia is a natural result of the drains to which the system is subjected, but it may easily escape observation for a time, being masked by an unusual redness of the lips and a passive dilatation of the capillaries of the face. Consequent upon this thinness of the blood, dropsy is frequently developed, despite the discharge of perhaps five or six times the natural amount of fluid from the body. The œdema is soft and painless, and is usually confined to the lower extremities. It comes and goes in accordance with the changing conditions of the circulation.

Boils and Carbuncles are of frequent occurrence in diabetics, and especially in elderly people. The presence of a carbuncle should always suggest the examination of the urine for sugar, even if no other indication of diabetes is apparent.

Gangrene resembling the senile form in its appearance and progress, is an occasional though rare complication. It most frequently attacks the toes, but may appear upon any part of the body in which the circulation is inactive.

Changes in the Eye.—Mitchell, pointed out many years ago, that injecting a solution of sugar beneath the skin of a frog would produce in the course of twenty-four hours an opacity of the crystalline lens, which would promptly disappear when the animal was restored to the normal medium. These experiments threw much light upon the fact already known that diabetics were especially liable to cataract. This is indeed the change most frequently observed in the eye. It occurs in about three or four per cent. of the cases of diabetes. Richardson subsequently found that artificial cataract could be produced by a variety of saline solutions, as well as by the sugar used in Mitchell's experiments. The only essential condition was that the density of the solution should be greater than that of the blood. The fluids of the lens are withdrawn by osmosis, passing into the denser contiguous humors. A deposition of calcareous matter

takes place in the lens after a time, and the opacity which might otherwise have been transient is rendered permanent.

Diabetic cataract is one of the very late phenomena of the disease, and indicates that the system is profoundly involved. It usually affects both eyes, either at the same time or successively. It is remarkable for the rapidity with which the opacity when once begun goes on to completion. Dickinson states that the whole process is concluded not infrequently within a week.

The variety is usually the soft, but in elderly persons it may be firm, and contain a hard nucleus as in other forms of senile cataract.

These cases are not well adapted for operation, as the wound does not heal readily, as a rule. Moreover, the general health is apt to be so greatly impaired by the time diabetic cataract makes its appearance, that the remnant of life left to the patient seems scarcely to warrant an operation with such doubtful issue. Changes in the fundus are occasionally observed, which bear a strong resemblance to those occurring in Bright's disease. Hæmorrhages, some of considerable size, are present in most cases. These sometimes lead to secondary retinitis. When associated with opacity of the vitreous, these changes are specially significant of diabetes, and have sufficed for a diagnosis prior to examination of the urine.