

THE TREATMENT OF DIABETES MELLITUS

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MODESTY is becoming to the peddler of diabetic wares who takes off his well-worn though not heavy pack in this year of our Lord nineteen hundred and twenty-four that he may show his assortment to a Canadian audience. The peddler knows full well that what he has to offer bears no resemblance to the jewels which younger peddlers have recently displayed, but only plain housekeeping utensils, which, however, he recommends as having served his own rather numerous diabetic family in good stead.

Prior to 1914 conservatism was the most useful measure employed in diabetic treatment. If the patient was doing fairly well, the wise doctor left him alone, because he realized that the mere transfer to a hospital with consequent changes in diet and daily routine resulted in the death of one-fourth of the cases so transferred, that overexertion and excitement, just as fever and pregnancy, brought on coma, which he then honestly, but erroneously, told the sorrowing friends was the natural culmination of the disease. Therefore, conservatism in diet, conservatism in surgery, conservatism exhibited by the avoidance of drugs, gave the best results. Living in this manner for an average period of four and eight-tenths (4.8) years with their diabetes, three hundred and thirty-one of my cases died. Even at that time were exceptional cases whose onset was above the age of fifty years who lived out their respective expectations of life. Nevertheless this was a dismal epoch, because fear ruled; yet it served a purpose, because all learned that the average diabetic, conservatively treated, could live 4.8 years and that someone had blundered if he lived less.

In June, 1914, the situation changed, and diabetic housekeeping began to be easier, because a new implement, not adequately appreciated before, was introduced, namely, undernutrition. It was such a satisfaction to have a theory for a guide that the implement

was abused, dreadfully at first, less later, until at length it found a sure place in the daily life of the diabetic. Undernutrition really worked marvels with a chronic disease. Children lived twice as long; death in the first year of the disease was declared unpardonable, and in the Shattuck lecture I felt so sure of my ground as to claim coma avoidable and not the decree of fate. With conservatism plus undernutrition, five hundred and ninety-seven diabetics died, having withstood diabetes for six years. Progress was being made.

Undernutrition simplified our understanding of diabetes. It tempted and allowed a study of the elementary principles of diet, an analysis of the excretions of the fasting diabetic for comparison with those of the fasting normal, promoted accurate and tentative methods of dietary control of the patient, stimulated in all the laboratories the scientific investigation of clinical cases, and thus brought nearer together the laboratory and the clinic and made evident their interdependence. And since undernutrition preceding diabetes was proved to be exceptional and overnutrition the rule, the conclusion was reached that most cases of diabetes are preventable by avoidance of excess of weight. Thanks to the introduction of undernutrition, we have come to realize that diabetes is twenty-times more common in fat than in thin adults, and that this is our best, if not our only safeguard, against its onset.

In this period an expectant world was struggling to perfect its knowledge of diabetes and hoping against hope for the discovery of insulin, which you are all justly proud to claim, and the world to acknowledge, resulted from the initiative and hard work of Canadian youths. It is fortunate that you do not expect new ideas about insulin from me, but I know you will share my pleasure when I report the transformation it has wrought in my clientele. The weak ones have become strong, the men-

tally inactive have become alert, and wan bodies through added nutrition have assumed the appearance of health.

Sufficient time has not elapsed to demonstrate by statistics the lengthening years which insulin will give to the diabetic, but certain statements are allowable as well as desirable, because they are encouraging and at the same time point a lesson for the future. As heretofore facts rather than speculation should rule, and hence I shall pass over any consideration of the six or seven hundred of my patients who are taking insulin and refer only to the 127 individuals who began to take insulin prior to May, 1923, through the courtesy of the Insulin Committee of Toronto, and have on the average taken it for at least a year and a half. In this group of 127 cases already reported a year ago, there have been 23 deaths. The average duration of the diabetes for these fatal cases has been 5.3 years and of the remaining 104 living patients has reached 5.4 years. These figures make it perfectly evident that the duration of 6 years of diabetes, which was the record prior to the introduction of insulin, will be greatly surpassed, because it is inconceivable that in the coming 12 months all the 104 living cases will perish.

The causes of death of the patients taking insulin is of far more value than a recital of the duration of their diabetes. Analysis shows that 4 of the deaths were of cardio-renal origin and 4 were due to pneumonia,—conditions more commonly found in diabetes than in the community as a whole, but conditions which with better treatment of diabetes may become less frequent. Four more deaths were caused by diseases which also are encountered regularly in non-diabetics. These were meningitis, erysipelas, tuberculosis, intestinal obstruction, the latter in a woman over 80 years of age. The next two deaths are especially peculiar to diabetes. These were due to septicemia in one instance and to multiple abscesses in the other and may be classed among the needless diabetic deaths. There remain 9 deaths from coma, and these will bear a somewhat closer inspection. Among these, seven of the deaths seem especially pathetic. The patients ignorantly stopped insulin and continued the high diet, the patients deliberately broke dietetic rules while continuing insulin, or wantonly gave

up both diet and insulin. Deaths from such reasons, therefore, are amenable to prevention, and if we are to succeed in securing the full benefit of insulin, it is evident each one of us must follow up the intimate medical life of our patients more closely, so that like occurrences may be avoided. The constant care of the diabetic cannot be too strongly emphasized. No method of treatment in diabetes has yet reached such a stage of perfection that it allows the patient to live without keeping in close contact with his doctor.

The average dose of insulin taken by my patients who began it over a year ago has risen to 21 units daily. This is about twice as large as the same patients were taking when they were reported in May, 1923. Whether it will be necessary and whether it will be advantageous during the coming twelve months for these patients again to double their insulin is questionable, but I suspect the average dose will rise rather than fall. In this connection the amount of insulin employed by certain severe diabetics, formerly and to-day, deserves notice. Case No. 3496 has now had diabetes for eight years. He was in coma and rescued by insulin in Florida a year ago. Six months later when I first saw him he was taking 88 units of insulin, but after another six months of treatment the insulin has been decreased to 20 units, and the young man's weight has risen by 20 pounds. This decrease in insulin and increase in weight came about as the result of the admixture of the brains of his nurse and his own brains with the drug. At present the carbohydrate in the diet is 100 grams and the urine is sugar free. He is now in better condition with his 20 units than he was formerly with 88 units. Two young girls after a year and a half of diabetes, which began with 9.0 per cent and 6.0 per cent of sugar in the urine respectively, have gained weight and strength and appear in perfect physical condition. The one, Case No. 2962, is taking 87 grams of carbohydrate with 15 units of insulin, and the other, Case No. 3078, 68 grams of carbohydrate with no insulin since April 27, 1924. I can but feel that these children are safer to-day upon their diet, restricted though it be, than similar children taking 20 to 40 grams more carbohydrate, but dependent upon 60 to 80 units of insulin. What will be the condition of

such groups of children and what will be the number of units which each group is taking when they have attained the average duration of the disease of diabetic children without insulin—namely 3.3 years? Finally, in this connection one other patient deserves record, Case No. 632. He acquired diabetes at the age of 30 years, lived 10 years without insulin, but with it has come back to life, gained a reasonable amount of weight, and his strength, as tested some months ago, had already reached 89 per cent of normal. This man, it is true, is taking but 40-odd grams of carbohydrate, but this is twice what he was able to take before insulin, and upon it he keeps sugar free. His dosage of insulin was never high, and is now but 10 to 14 units a day. Should this conscientious diabetic of 12 years' duration be forced to take 100 grams of carbohydrate and enough insulin to make that possible? Is that reasonable? Put yourself in his place. Would you not prefer to wait another year to see what has happened to the two children of a year and a half duration who are taking 60 to 80 units as compared with the similar children who are taking but 20 units?

It may be urged that if all my patients had taken larger doses of insulin and more carbohydrate had been allowed they would have adhered more closely to the diet and more would be alive to-day. This I doubt in most instances. I have had experience along that line. The individual who broke the diet with 24 units of insulin later broke the diet with 48 units of insulin. Shall I give her 96 units when I know that her nutrition is good and her strength adequate and that she can keep sugar free provided she cares to do so? Do you believe a patient is safer with 96 units of insulin than with 48 if on the smaller dose he can maintain health and strength? Conservatism and undernutrition have been very useful utensils in the past.

A knowledge of diabetes on the part of the physician and the patient is essential for successful treatment, and insulin has done more to bring this about than anything else. Fortunately a knowledge of diabetes implies a knowledge of diet, and the doctor who understands the dietetic treatment of his diabetic patients is well equipped for the dietetic treatment of

his other patients, often suffering with cardiovascular disease, nephritis, obesity and constipation. The dietetic knowledge which insulin has spread extends far beyond the confines of diabetes.

Certain practical considerations I never fail to mention when talking to my patients. Each one before he leaves the hospital is taught how to avoid the two chief causes of death in diabetes, namely, coma and gangrene. He is told that the prevention of coma is comparatively easy if he will keep sugar free, and that he is to notify his doctor of any indisposition. I say to the patients that if they feel "sick" from any cause, they must (1) go to bed; (2) drink a glass of hot liquid each hour; (3) move the bowels by enema; (4) keep warm; (5) secure a nurse or someone in the family to care for them. All these measures they should begin before the doctor arrives. It is for the doctor and not the patient to determine whether the indisposition is due to acidosis or whether coma, if present, is caused by meningitis, apoplexy, Bright's disease, a narcotic or some other cause. It is for the doctor to determine how much insulin shall be given each hour, and this it is easy for him to find out by making hourly quantitative examinations of the urine, inserting a permanent catheter into the bladder, if need be, for that purpose. The doctor must decide whether the body is so deficient in liquid that it demands salt solution subcutaneously and whether the heart is so weakened that caffeine and other heart stimulants are necessary.

Each patient above the age of 40 years is also given directions to avoid gangrene, which with local infections caused half the deaths from diabetes last year in the larger hospitals of Boston. The following simple advice is distributed to the patients with this end in view.

TREATMENT OF FEET

Hygiene of the Feet:—

1.—Wash feet daily with soap and water. Dry thoroughly, especially between toes, using pressure rather than vigorous rubbing.

2.—When thoroughly dry, rub well with hydrous lanolin as often as necessary to keep skin soft, supple and free from scales and dryness, but not enough to render feet tender. If nails are brittle and dry, soften by soaking in warm water one-half hour each night and apply lanolin generously under and about nails and bandage loosely. Clean nails with orange-wood sticks. Cut the nails only in a good light and after a

bath, when the feet are very clean. Cut the nails straight across to avoid injury to the toes. If you go to a chiropodist, tell him you have diabetes.

3.—Wear shoes which are large, broad and flexible and do not bind or rub. Wear new shoes one-half hour only on the first day and increase one hour daily.

4.—If the feet become too soft and tender, rub once a day with alcohol.

Treatment of Corns and Callosities:—

1.—Wear shoes which cause no pressure. The Japanese seldom have gangrene. Beware of nails and torn linings in old shoes and wear new shoes for the first time in the evening. It is wise to have two pairs of shoes which differ slightly from one another and to wear them on successive days.

2.—Soak foot in warm, soapy water; dry and rub with gauze, or file off dead skin. A corn may be painted with the following mixture: salicylic acid, 1 drachm; collodion, 1 ounce. Repeat for four nights; then, after soaking in warm water, the corn will come off easily.

3.—Do not cut corns or callosities.

4.—Wear pad to distribute pressure if necessary.

Circulatory Aids:—

1.—Exercises. Bend the foot down and up as far as it will go 6 times. Describe a circle to the left with the foot 6 times and then to the right. Repeat morning, noon, and night. Rising on tiptoes 20 times is an excellent exercise.

2.—If subject to chilblains, wash feet daily in warm water, dry carefully, and powder lightly with borated talcum powder. Wear woollen stockings and avoid extremes of temperature.

3.—Massage with lanolin.

4.—Buerger gravity—hyperemia method for bed patients gives excellent results, as does the violet ray in indolent sores.

Treatment of Abrasions of the Skin:—

1.—Insignificant injuries in the diabetic may result very seriously. Therefore, proper first-aid treatment is of the utmost importance. Consult your physician.

2.—Avoid strong irritating antiseptics, such as sulpho-naphthol and iodine.

3.—As soon as possible after injury certain surgeons recommend the application of sterile gauze saturated with medicated alcohol. Keep wet for one hour by pouring on more alcohol. Sterile gauze in sealed packets may be purchased at drug stores. Purchase a tube of

boric acid ointment. Later keep wound covered with boric acid ointment on sterile gauze. Change daily until healed.

4.—Elevate and, as much as possible until recovery, avoid using the foot.

5.—Consult your doctor for any redness, pain, swelling, or other evidence of inflammation.

The peddler's homely wares you have seen. He will not be disappointed if they do not find ready purchase, because very likely you have better, and in fact he himself is always looking for a better stock in trade. There remains, however, in the bag, an intangible something which is not for display or sale and yet perhaps eventually will prove to be almost as great a gift to medicine as insulin itself, and to this your attention is called. Just as surely as insulin has revolutionized the treatment of diabetes, just so surely has the example of the Canadian student concerned in its discovery revolutionized the conception of the possibilities for good inherent in all medical students. We recognize this new motive in medicine in Boston, and it is my great privilege to add that as a result of gifts for this purpose from each and every one of the students in the Harvard Medical School and from patients and friends, a large section of the new dormitory of the Harvard Medical School will bear the name of Charles H. Best, a young man who has raised his medical standard so high that no other student of medicine in the world can fail to see it.

I congratulate you, therefore, physicians of Canada, on your two recent contributions to medicine—insulin and the productive type of medical student.

THE twelfth annual report, issued by the *Journal of the American Medical Association*, on typhoid fever in the sixty-nine cities in the United States with a population of more than 100,000 shows that every one of the twelve largest cities—that is, those with a population exceeding 500,000—had a typhoid death rate in 1923 under five per 100,000, the lowest figure hitherto recorded for the cities in this group. In fifty-seven cities the records extend back to 1910; the typhoid death rate in them was somewhat higher in 1923 than in 1922, but with that exception the rate was the lowest on record—namely, 3.45 per 100,000. Taking the whole

sixty-nine cities, the typhoid records for the last four years show a slight reduction in 1923 as compared with 1922. The opinion is expressed that, though the actual reduction in typhoid is less rapid than before, probably owing to the fact that the new group of young men reaching the age of typhoid susceptibility is no longer protected by inoculation, improvement in the typhoid situation is still progressing in many cities. It is hoped that a further diminution will occur within the next few years, especially if rural typhoid can be eradicated.