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Review Article

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How Did Things Get So Bad? - The Past, Present and Future of Diabetes Type Two.

Peter Mansfield*

MA MB BChir, Aviation Medical Examiner (Retired)

***Corresponding Author:** Peter Mansfield, MA MB BChir, Aviation Medical Examiner (Retired).

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Abstract

This paper reviews the history of diabetes Type Two, from the beginning of settled farming, and explains why there has from the 1950s until recently been so little emphasis on the prevention and reversal of the disease.

Pilots and others in the early stages of diabetes have reversed their condition permanently by limiting carbohydrate intake. With little or no glucose in the blood, there is no diabetic challenge.

Carbohydrate intake has recently been linked by nutritional academics with diabetes risk. Carbohydrate restriction is the underlying principle of several diets, and resembles the diet available historically, prior to settled agriculture.

The prize that motivates the pilot is unrestricted certification as fit to fly. The public has no such motivation, so diabetes is unnecessarily prevalent. We need to develop charges, no-claims discounts or tax incentives to encourage everyone to follow the pilot's example.

The Past

According to the WHO Global Report on Diabetes 2016, some 422m adults were living with diabetes in 2014, nearly four times the number in 1980. Age-standardized prevalence rose in the same period from 4.7% to 8.5%. The rise was faster in low- and middle-income than in high-income countries.

We can assume, as a first approximation, that Diabetes Type Two did not occur among Paleolithic hunter-gatherers, whose carbohydrate consumption was low and physical activity high. The possibility of an assault on the pancreas only arose when farmers settled on the land and developed carbohydrate-rich grain crops. This began in Egypt and the Middle East around 8000BC.

This development was crucial to the advancement of civilization since grains can be stored in bulk for months without serious decay, because of the closed structure of their starch grains. A community that was not completely preoccupied with survival could develop a written and built culture.

For centuries thereafter, this improved supply of metabolic fuel enabled a large slave population to toil hard and long, in the fields or the monumental construction projects of that age. Only the idle rich came anywhere near risking diabetes, and it is hard to determine whether they did [1].

By the 19th Century, however, toil was diminishing and refined carbohydrates – including sugar – were becoming generally affordable.

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In the 20th, both accelerated exponentially: machinery took over from muscular effort, but carbohydrate consumption rose relentlessly.

Key Person

This was the state of affairs, when John Butterfield came on the scene. He qualified in medicine around 1945 and by the 1950s was an MRC Research Fellow investigating glucose metabolism in Bedford, England. During this period he identified and named Diabetes Type Two, and revealed its hidden prevalence [2]. A ten-year follow-up study in Bedford ensued, but the MRC declined on political grounds to fund further diabetes research proposals put forward by Butterfield – still early in a brilliant and distinguished career.

Rather than abandon his ideas, Butterfield broke more new ground. He went to industry in search of funding. The most favourable response he received was from the largest sugar company in Britain. They offered generous funding for research into diabetes, provided that no link with sugar consumption were ever mentioned or pursued.

Butterfield accepted these terms, keenly aware of the commercial and political constraints imposed by the world he was entering, and determined to make the best of them. He turned his attention to the genetic and immunological aspects of diabetes, and the development of human-identical insulin.

He was faithful to the terms of his original funders throughout his years directing research at Guy's Hospital, and as WHO worldwide Principal Adviser in Diabetes. But he disclosed them to me without hesitation in 1985 when, during a private conversation at his rooms in Downing College, Cambridge, I asked him why diabetes prevention had received so little research attention.

I in turn respected his confidence until long after his death, when in 2015 "Action on Sugar", a consensus campaign by leading academics to highlight the dangers of sugar consumption, included diabetes as one of them [3].

Baron Butterfield of Stechford – otherwise Professor Sir William John Hughes Butterfield Kt OBE FRCP - died in 2000 aged 80, deservedly honoured for his wisdom, integrity and scientific distinction.

The Modern Era

During the 50 years of Butterfield's career, the effect of his understanding with his financial sponsors spanned the globe. Anyone who questioned the causation of diabetes was accused of blaming the victim. Established diabetic specialists regarded Type One diabetics as "normal people except they have to inject themselves twice a day". Consultants were only interested in diagnosing and treating diabetes, not at all curious about its cause. It was standard to recommend that patients eat as much good food as they like, covered by however much hypoglycaemic therapy that called for.

This culture is just one example of a general schism in medical thought, which dates back centuries. That has been characterised by Coulter [4] as a dichotomy between rationalism and empiricism. The preceding paragraph is an example of rationalist thinking, which argues from the disease back to the patient. Thus, the diabetic is sick because his or her pancreas produces too little insulin. The response is to adjust the disease, by giving medication. It is the disease that is medicated, rather than the patient.

The empiricist thinks the other way around, starting from the patient. His or her pancreas secretes too little insulin (because he or she is diabetic, which to the empiricist is secondary). The patient's primary option is dietary adjustment, reducing or abolishing the need for any further action.

Air pilots are a special case. They love to fly, and the professionals are well paid. But they must demonstrate medical fitness at regular intervals, and until recently diabetes was a bar to flying. It still imposes severe limitations on the pilot, who must repeatedly provide medical evidence of good control. Many pilots will work hard to get rid of the hassle.

Suitable diets have been available for decades. The Palaeolithic Diet [5] employs only food available before settled farming, and excludes dairy produce as well as grains. This is more rigorous than diabetics require. Most appropriate is the Atkins Diet [6], which infuriated the nutritional orthodoxy because, contrary to their teaching, it works. Atkins was not the first to advocate carbohydrate restriction, but far the best publicised [7,8].

I have not been in an ethical position to collect systematic data from the 1100 pilots that were registered with me. About half of these are professionals, only 5 of whom (1%) were grounded for obesity. All were able to resume their careers once they had reduced their BMI below 35.

Many more of the professionals – perhaps 20% – were overweight, and half of these slimmed successfully. Few of the professionals

were diabetic but around 40 (8%) of the amateurs were. About half of these reduced their weight and reliance on hypoglycaemic medication to some extent. Five (1%) successfully came off medication and returned their glycaemic chemistry to normal levels. They had cured themselves.

The Future

Near-zero tolerance, of self-inflicted obesity and Type Two Diabetes, is feasible. Type Two Diabetes is curable if detected early. Major effort is however required on the part of each affected person. The upheaval required in medical culture and public health policy is immense. But something must be done to make our medical services affordable, which means sustainable.

Medical care systems funded entirely from the public purse, with no charge to the patient at the point of use, seriously deter self-help. Money talks to most people, and it should not be anathema to attach charges to medical care, even in Britain. They need not be prohibitive, but must provide a sufficient disincentive alongside ample assistance for self-improvement. Charging only 5 pence for a plastic bag has reduced their distribution in Britain by 90% since 2014 [9].

In Britain, tax allowances offer another persuasive opportunity. In medical care systems funded partly or completely by insurance, a system of no-claims bonuses becomes practical. Either of these may reward evidence of satisfactory body metrics and sufficient exercise, or else penalise the use of services, on a scale that reflects their cost.

If financial incentives are distasteful to the public, then perhaps honours would work better. British citizens who make outstanding contributions to society may receive honours from the Crown. These are respected, and highly coveted. Perhaps people who never see their doctors should be eligible?

Conclusion

Our fatalistic attitude to diabetes type two (and obesity) was misled for sixty years by constraints imposed as conditions of research funding. That spell is now broken. We can hope for radical reduction in incidence, prevalence and morbidity of diabetes type two, but must find strong ways to encourage individuals to help themselves. This is just one motive for radical changes in the assumptions underlying cherished medical systems across the globe.

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