Importance of getting the diabetes message out there

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Q What was it that originally drew you to working in the field of diabetes?

There were two reasons why I was originally interested in diabetes. First, there was the opportunity for good patient contact, you get to know the patients well and can follow them long term. Although I am now semiretired, I still do two clinics a week, which I value very much. In those clinics I've got several patients who were some of my first patients when I moved to Birmingham back in 1983.

The second draw was the fact that diabetes affects virtually every system in the body. With an interest in general medicine you couldn't really go into a better speciality; whether you have got an interest in the nervous system, gut, heart, kidneys or eyes, diabetes covers it very nicely.

Q What do you think has been your biggest achievement in your career so far?

I think it depends how you look at it. If we consider the clinical side then I suppose it

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has been the development of our service at the Heart of England National Health Service (NHS) Foundation Trust and the opening of a fantastic new diabetes center 4 years ago. We did have a diabetes center prior to the one I work in now, but the new one is 'state of the art' (a recent external review indicated that it could act as a template worldwide for how diabetes care should be provided). Basically, it is a 'one stop shop' that has everything that a diabetes center might require: highly trained dedicated staff and services that cover virtually every eventuality related to diabetes and endocrinology under a single roof. The multiprofessional team includes doctors, nurses, chiropodists, eye screeners, visiting renal physicians and vascular surgeons, and a large weight management service and bariatric service for obesity. We have 12,000 diabetes patients on the books, and probably another 5000 with other endocrine problems. The center is visited by patients some 35,000-times a year. While there are other first-rate diabetes centers in the UK, I think there are very few that provide quite as comprehensive services as we do. Crucially, the center is also attached to our research facility, allowing translational research to be an ongoing feature of our clinical service. It is a fantastic GBP 12 million facility and I am proud to say that I was a major driving force for its development and I managed to get quite a lot of the money required to set it up. From a clinical perspective, I think that has probably been the most important and tangible achievement.

From a research perspective, in collaboration with John Todd's group from the University of Oxford (Oxford, UK), we described the first genome-wide scan for a 'complex' disease (Type 1 diabetes). This paper was published in *Nature* in 1994 and was highlighted as their article of the week [1,2]. It was important because it actually led the way for similar studies not just in diabetes, but also in a whole range of complex diseases where several genes are involved in susceptibility, and environmental factors are also influential. From a basic scientific point of view, that was probably my most important achievement.

We have also carried out a lot of work related to the pathophysiology and management of diabetes, particularly Type 2 diabetes. Looking at new therapies, we have worked on novel insulins, new devices and drugs. We have also worked on projects related to the provision of healthcare in deprived populations, particularly ethnic minority groups.

From an educational perspective, my most significant achievement has been training not just young diabetologists, but also the fairly extensive work I do in primary care and with the media. For many years I edited a whole range of journals in diabetes aimed at the primary care multiprofessional team. So there have been all sorts of achievements, over a long career.

Q You talk about educating young diabetologists & primary care physicians, but as well as this you also play a role in conveying information about diabetes to the public. How important do you think it is for clinicians & researchers to be good communicators?

I think it is incredibly important. To an extent, it is no good having fantastic information and research if you can't communicate it properly. I think it is especially important with a chronic disease, where there is no 'magic bullet' to cure it. It's not like giving an antibiotic to cure an infection. Diabetes is a long-term condition and if you do not get the public on board then I think from a macro perspective, you're not going to get very far. I think that being able to convey information to nonspecialists within the profession, and also to lay people, is vital. I am lucky, I have been told that I am quite media savvy and I have done a lot of work with both the medical press and the lay media. I have acted as an advisor to the BBC, Channel 4, the *Daily* and *Sunday Express*, and the *Daily Mail* and *Mail on Sunday*. For example, I recently gave advice to the 'Today' program on BBC Radio 4. I have also done a lot of work with some of the prominent British newspapers, for example, the *Sunday Times* and *Telegraph*, among others. It is absolutely vital that we get appropriate messages across to the lay public and to

the lay media because there are so many misunderstandings out there.

For example, part of the obesity problem is that we are constantly bombarded by advertising from the food industry, which is not always very clear. For example, labeling foods as 'healthy' by saying that they are 90% fat free, actually means by definition that they are 10% fat. Fat provides twice the number of calories as other foods. Products advertised as low fat and, therefore, 'healthy' options almost inevitably contain high sugar. This is, of course, not highlighted on the labeling or is described in such a way that most people are not aware that the ingredient named is a sugar. Personally, I think there are a lot of vested interests that are not helping the general public in avoiding obesity and diabetes, and they certainly do not help from the point of view of the management of diabetes. I think this makes it even more important for doctors to speak out about true findings and research.

As a country we certainly need to put more into these public health messages, as we are seemingly lagging behind other nations. For example, if you look at what happened in Finland in the early 1960s when they had the highest rates of heart disease in the world, their campaign was very successful. Major public health programs were put in place and they achieved 'buy-in' from the whole population, they tackled food labeling, encouraged avoidance of fast foods, banned sugar-laden drinks in schools and encouraged exercise programs. Amazingly, the country reduced cardiovascular rates in a generation by approximately two-thirds. There are also major initiatives in France, for example the EPODE program, which aims to tackle childhood obesity, and it has been very successful. Many other countries are now part of this program. In the UK, we do not seem to be able to get it right. I think that successive governments seem to have been afraid of introducing change that may not be popular. I think there is a significant role here for health professional organizations to get more involved. Maybe people will listen to them more than they will listen to the politicians, I do not know. What I do know, however, is that the only way forward in this area is to gain buy-in from our whole population and this will mean major public health campaigns and involvement not just at government level but in localities at the 'grass roots' (these campaigns can be successful, e.g., our own campaign against cigarette smoking, HIV and cervical screening, as well as the examples I've given from Finland and France). In my opinion, if we do not do something about our overweight and obesity problem very soon, there will probably be severe financial impact on the NHS and, in turn, the whole economy. Politicians have a responsibility to be open to advice from health professionals and if we can have open discussions between the two then hopefully this will lead to more effective policies.

However, I think it is important to say, on a positive note, that we have seen a plethora of really well-conducted trials in diabetes in recent years, some of them answering really important clinical questions. There is still a lack of information from 'real-life' observational studies, which will help us better understand, for example, the place of exciting new therapies and other methods of management in real-life situations. I think that should be emphasized as a really important next step.

Q You have published extensively on the genetics of diabetes. How have you seen this field evolve?

I think there are positives and negatives with the genetics side. We have published extensively on genetics for both Type 1 and 2 diabetes. There have been many major developments when I think back to how primitive we were in the way that we tackled the genetics of diabetes back in the 1980s. Clearly, things have moved on a pace and I think it is, in part, due to incredible developments in technology. For example, we now have the ability to perform genome-wide scans to identify genetic associations in complex diseases. I think that side of things, and the fact that studies can now be carried out at an 'industrial' level at a much lower cost, has enabled better genetic characterization of a whole range of diseases. The other very important development, which goes hand in hand, is the use of very large and well characterized

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data sets. Both of these aspects have really moved the field forward, and this has led to an improvement in our understanding of the pathophysiology of both Type 1 and 2 diabetes.

Q Where does our knowledge of the genetics behind diabetes stand at the moment? What do we still need to learn?

We still have a very long way to go in defining the genetics of both types of diabetes. I think the big question is how environmental and genetic factors interact, and how that knowledge might be used to develop new prevention and management strategies. If I was being negative I would say, yes I think we have learnt a lot but this hasn't progressed sufficiently for us to be talking about prevention and cure of the disease. These really have to be the next step.

Q Do you think improving our knowledge of the genetics of diabetes will lead to more personalized treatment of the disease?

I think so. 'Personalized' or 'individualized' treatments are the buzz words at the moment. The hope is that in years to come our knowledge of genetics will allow much more personal and, therefore, more effective treatment of diabetes. Of course, genetics will also help us in terms of predicting who is going to get the disease. What we would really like is to use that knowledge to prevent the disease. The Holy Grail isn't better treatment. It is prevention of both Type 1 and 2 diabetes.

My wife often pulls my leg because when I first started out in diabetes research I told her that my aim was to cure diabetes. She says "you're here 30 years later and there are even more cases of diabetes, you have not cured it." It is frustrating because we are now in a position that we know how to prevent the common Type 2 diabetes, but we do not seem to have the wherewithal to enact it. We know that if we could prevent people from becoming overweight then we would prevent 80% of cases of Type 2 diabetes. So in a way, it has to be said that the environmental factors are more important than the genetic factors. It seems to be getting that message out and then doing something about it that's the problem.

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Q You are also an expert in the long-term vascular problems that are related to diabetes. What is the hottest topic in this area right now?

One of the hottest topics at the moment is the question of cardiovascular protection from the new therapies for glycemia and whether some of the traditional therapies influence cardiovascular risk. It remains controversial as to whether metformin is truly cardioprotective and, indeed, whether sulfonylureas might actually increase cardiovascular risk. Then there is a whole plethora of unsubstantiated evidence that suggests that some of the newer therapies may actually reduce cardiovascular risk. There are many trials ongoing at the moment looking at cardiovascular outcomes. These are long-term trials in large numbers of patients, particularly in the DPP-4 inhibitor and GLP-1 agonist arena, and now we're starting to see them with SGLT-2 inhibitors as well. The results of the first major trials are expected later this year. So it's quite an exciting time. Whether or not cardiovascular risk with new therapies should be the most exciting topic in diabetes is arguable, I think, but it is certainly what is current at the moment.

Q Which of the projects that you are working on at the moment excites you the most & why?

Our group is involved in some of the cardiovascular outcome trials. We are also involved in ongoing research into new therapies (SGLT-2 inhibitors, DPP-4 inhibitors and GLP-1 agonists), as well as new basal analogs.

From a purely personal point of view, away from the multicenter studies, there are two areas that I'm very excited about. First, we are still following up our UK Asian Type 2 diabetes cohort, and we have now got 10-year data on these patients. We are now in a position to study cardiovascular and mortality outcomes compared with a white, geographically matched group of people with Type 2 diabetes. I think there's going to be some really interesting information there. We already know there is a massively increased risk, not just of diabetes but also cardiovascular disease, in the south Asian population, so

we are interested in finding out why that might be [3].

Second, we are trying to characterize young-onset Type 2 diabetes. These individuals appear to have a very aggressive form of disease and potentially face many years of debility from long-term complications and premature death. We are looking at people diagnosed with Type 2 diabetes before the age of 40 years and trying to determine any differences in their natural history and also their response to therapies compared with individuals diagnosed with the condition at a more traditional older age.

Q What do you hope to work on next?

I'm actually semiretired now so these projects will probably see me through. The project that I really want to get off the ground is the work with the young Type 2 cohort. This is a very important group of people. We know from studies in the USA that the prognosis for these people is very poor. The younger you develop Type 2 diabetes the more life years you lose from the condition. If you are diagnosed in your teens you've got a one in three chance of not surviving past the age of 40 years. Others suffer heart disease, blindness or amputation. Our research will initially study around 600 such patients to try to improve our knowledge of this population and how we can help them.

Q Where do you see the state of diabetes in the next 10–15 years?

I think there will be positive steps in the understanding of the pathophysiology of disease and this improved understanding should lead to improved treatments and possibilities for prevention. I really hope that we will also see improved public health awareness and patient education.

Unfortunately, I think that increasing financial difficulties for the health service will mean that things such as specialist diabetes care and individualization of treatment will come under closer scrutiny. Personally, I am concerned that people who 'hold the purse strings' are likely to see these as costly approaches because the positive impacts of spending money on these strategies will not necessarily become apparent straight away. Improved outcomes from high-quality care may take some years, but I think it is very important that we continue to invest now. I only hope that decision-makers will be willing to listen to advice from healthcare professionals and other experts.

Finally and very much related to all this, it is widely accepted that the obesity epidemic is growing and will continue to grow, so I believe it is paramount that we do something about it, which must involve buy-in from the public, even though this may mean some tough decisions may have to be made.

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Disclaimer

The opinions expressed in this interview are those of the interviewee and do not necessarily reflect the views of Future Medicine Ltd.

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AH Barnett has received honoraria for lectures and advisory work from industry related to his interest in new therapies for diabetes, including Novo Nordisk, Sanofi-Aventis, Eli Lilly, MSD, Novartis, Boehringer-Ingelheim, Bristol-Myers Squibb/AstraZeneca, Roche, GlaxoSmithKline and Takeda. He has no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

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