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The Underpinnings of Exceptional Longevity

BY STUDYING AGE IN THE ELDERLY, WE MAY FIND A WAY TO LIVE LONGER AND IN BETTER HEALTH

By studying age in the elderly, we may find a way to live longer and in better health. You are listening to www.reachmd.com, The Channel for Medical Professionals. Today we have a special segment on the future of medicine. I am your host Dr. Maurice Pickard and with me today is my special guest, Dr. Nir Barzilai. Dr. Barzilai is the director of the Institute for Aging Research at the Albert Einstein College of Medicine and he is also a professor of medicine and professor genetics at the Albert Einstein College of Medicine.

MAURICE PICKARD:

Thank you very much for joining us today.

DR. NIR BARZILAI:

And it's a pleasure to be with you.

DR. MAURICE PICKARD:

To begin with, with 55,000 centenarians is it time that we begin to study them rather than excluding them from medical research?

DR. NIR BARZILAI:

That's a great question and underlines the fact that that's who I am studying, but I would say something else to begin with. We haven't been studying people between the ages of 65 and 85; for instance when it comes to drugs and their side effects and their durability and things like that so we have a lot of people to study; I would say that those centenarians should be studied separately and I hope to convince you during our conversation of why it will be important to study them in a unique way.

DR. MAURICE PICKARD:

Well can you tell me how is your work focusing on the possible ways to live longer and in better health rather than always focusing on

what is the underlying cause of disease?

DR. NIR BARZILAI:

You know, when we went to our first centenarians and asked them among many of the questions we asked them an open question, why do you think you live to be so old. What they are telling us is usually 2 things - one is hey, my mother was 102; my grandfather was 108; well there is a family history of longevity in their family. Okay, so they are unique in that, but then we asked them you know tell us the truth what did you do, did you eat yogurt all your life, were you vegetarians, were you exercising and it's interesting that 450 centenarians; later I do not have anything like that to tell you. So this combination of having a family history and not having anything that they interacted with the environment; many of them have been obese, many of them have been smoking. One of my subjects have been smoking for 92 years 2 packs a day made me think that those guys have something that protect them, which is different than the rest of us that have something that kills us on an average age of 78 in the United States.

DR. MAURICE PICKARD:

And as we will talk, I know your research deals with Ashkenazi Jews and we will come back to why you selected that particular probing, but certainly I have always associated Ashkenazi Jews with people who ate Eastern European diets, did not exercise, often smoked over 20 years during their life; in fact my father used to tell me that the only Ashkenazi Jew who ever jogged was usually in a program and I wonder is did your research show you that that was the lifestyle of the people that lived to be 100 or 85 to 100?

DR. NIR BARZILAI:

Pretty much its that way in the 100-year-old people, although my study really does not confirm those lifestyles in the rest of the Ashkenazi Jewish population. You know it really has been changing throughout the years because; for example once in the 50s, the obese people were also the rich people and now its the poor people that are obese people so there is what we call a cohort effect and I wouldn't know to put the Ashkenazi Jews there throughout this cohort, I think they were relatively poor before and they are relatively upper middle class now, but because of that, it is very hard to tell you the answer except that our centenarians have eaten what we tell our patients not to eat and have had a lifestyle that we tell our patients not to have.

DR. MAURICE PICKARD:

Well then can you tell me what is the longevity gene project?

DR. NIR BARZILAI:

The longevity gene project was designed to identify longevity genes. Longevity genes are genes that we believe are protecting against age-related diseases. Longevity genes are genes that if we could identify them, we can form a strategy to increase the healthy lifespan of the elderly population. Our goal is to prevent the chronic debilitating age-related diseases and to have a much better aging with better quality of life.

DR. MAURICE PICKARD:

With many of these people, I am sure that your studies who reached the advanced age did have chronic disease, didn't they and still were able to live what one would call a life with relatively good quality?

DR. NIR BARZILAI:

No, our population is quite different. Our population is characterized by a large percentage over 40% that go to age 100 without chronic disease and without taking in fact any drugs in order to treat chronic disease, so they are very unique even though they are 30 years older than the rest of the elderly population, they were relatively healthy and that's what was so interesting in them and that's what led us to study them.

DR. MAURICE PICKARD:

I know that your research deals with Ashkenazi Jews, why them?

DR. NIR BARZILAI:

The reason we picked Ashkenazi Jews have nothing to do with – a) the fact that you mentioned before that they have a special diet, it's really nothing to do with the fact that they are living longer or anything like that. It has to do with the fact that when you want to do genetic discoveries, you are trying to do them in population that are more homogeneous genetically. You know the best example now are the Icelandic people, there are a half million Icelandic people in Iceland and they are all offspring of 5 Vikings and 4 Irish women or something like that, so all half a million of them are coming from the same fathers and mothers and so you have much less noise so to say when you are looking at their genome. So the Ashkenazi Jews are derived in Eastern Europe and for some unfortunate history have been few and then are about 18 million around the world and they are very homogeneous and many discoveries are done in this population and that's the reason we chose them.

DR. MAURICE PICKARD:

So it's almost the same reason that people who are interested in a gene associated with ovarian or breast cancer also select this very same group.

DR. NIR BARZILAI:

Correct and it's not because Ashkenazi Jews have more breast cancer or ovary cancer, it's because that it was easier to find the mutation for breast cancer in this population than others.

DR. MAURICE PICKARD:

Is this what you would call the founder effect?

DR. NIR BARZILAI:

Exactly.

DR. MAURICE PICKARD:

Is this same work going on in Israel? Many Holocaust survivors immigrated to Israel and now have lived there their continuing years and we do not have a pool of sabra's or native-born Israelis to look at as well. So are we looking at this same research in Israel as well?

DR. NIR BARZILAI:

I have an IRB from the Israeli government to do this research in Israel. The funding is a little bit of a problem and I have done few, but not any systematic research in Israel. I can just tell you that we have Holocaust survival in our study and we also are in touch with the Holocaust organization. There are few people that were then at age 40 that really survived the camps. The camps were survived by younger people, but one of the questions for us has to do with the question if the starvation during the Holocaust has anything to do actually with an increased lifespan. I mean did they survive because part of their gene helped them to survive difficulties and stress or is it the caloric restriction during the Holocaust that is part of successful aging and we don't have an answer, but I think for us it's an interesting question that is in the heart of aging research.

DR. MAURICE PICKARD:

I know you are a medic in the Israel defense force and did this in some way direct you in your ultimate research?

DR. NIR BARZILAI:

You know in a strange way being a medic and then going to third world countries, I helped in the war in Cambodia, I helped during the apartheid in South Africa, I worked with the Zulus in Quazulu; it all looked like my career is going to go into helping actually young people surviving atrocities in wars and it became quite frustrating because you could save thousands of people everyday, but there was no political situation and eventually I thought I should try science because the solution depends almost only on me so that became less frustrating to deal with so I was in both world and that's what led from one to the other and that's what I did and I am happy where I am now.

DR. MAURICE PICKARD:

Well, I am glad, I am more glad you are here as well doing this very interesting research. Now getting to the research when you studied the probing and the children of somebody who had reached advanced age what did you find? Did you find anything different about their lipoproteins that they have a different phenotype, for example?

DR. NIR BARZILAI:

Yes, they had a different phenotype and really the major phenotype that stood out immediately is the fact that they are 100 years old and their offspring their children and we recruit their children, in fact we recruit probands, we recruit the centenarians only if they have offspring because its important for something that we can talk later, but one of the things that was striking in these families are that they had high levels of HDL cholesterol and not only high level of HDL cholesterol, but their lipoprotein sizes; that is the size of the HDL and

LDL they do come in different sizes in each one of them, but they had more of the large size than the small size and those were really amazing phenotypes and phenotypes that were inherited, so we could look at the heritability and the heritability of that was really very strong; so that's an example of one phenotype that actually led to our first discoveries of longevity genes. Another phenotype that was interesting was the fact that the offspring women of centenarians were shorter and had higher IgF-1 levels than our controlled population, that is age and matched and that led us to another discovery of mutation in the IgF receptor; so the lipoproteins and the IgF are actually examples of where a phenotype led us to the discovery of a genotype that we think is important to be able to reach such advanced age in a healthy situation.

DR. MAURICE PICKARD:

I want to thank Dr. Nir Barzilai who has been our guest today. He is the director of the Institute of Aging at Albert Einstein College and we have been discussing the future of medicine as it deals with aging and how setting our older population will give us answers that we all may benefit from in having a healthier life.

I am Dr. Maurice Pickard and I have been your host today and you have been listening to a special segment on the future of medicine with www.reachmd.com, the Channel for Medical Professionals. Please visit our website at www.reachmd.com, which features an entire library through on-demand pod casts. Thank you for listening.