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Q: Why is it so hard to find this cure for Alzheimer's?

A: In spite of the tremendous strides made, as a medical field, for instance, for managing such a complicated disease as HIV or many cancers or diabetes, the advancements of treatment of Alzheimer's are lagging quite a bit behind. And there are numerous reasons behind that process. One of the difficulties is the organ itself, the brain. It is a difficult organ to research, and it's virtually impossible to understand what is really happening in a brain. The blood brain barrier protects brain from not only viruses and bacteria but also from tremendously helpful drugs.

The other challenges are the lack of biomarkers. If for a cancer we can have a biopsy, if for diabetes we can have blood test, if for HIV we can have blood test. For a complex disease, like Alzheimer's, we really do not have good biomarkers.

Looking back on a number of clinical trials conducted, between the beginnings of the century to 2012, most of the clinical trials have patients that probably did not have biological markers specific for the clinical trials or a drug of interest. So, the targeted population of patient was probably diluted, up to twenty percent at some clinical trials, by patients that would not benefit from that specific drug. And that, by itself, diminish ability of drug to be developed.

Q: As a researcher, what does your typical day look like?

A: I administer clinical scales. Some of them are regulatory endpoints. Those regulatory endpoints would be what biomarkers or biopsies should be in medicine. They allowed us to see the baseline, to estimate a baseline of functional patient, what it looks like from the beginning. It allows us to see if there was any progress made. And it also a regulatory endpoint for the Food and Drug Administration, meaning, it says whether or not the drug has therapeutic effect, whether or not the drug separated from a placebo.

I work with family and caregivers. Some of the appointments are extremely long – three to four hours just for one patient. In essence, it is a concierge care. I feel that patients and caregivers take an enormous risk in participating clinical trials. This is not specific for Alzheimer's. This is just across any clinical trials.

And one of the ways to mitigate this risk is to provide them with all the possible attention and expertise. I have almost 20 years of direct clinical research experience. And that has allowed me to understand patients very well, the clinical presentation, making sure that they're safe in clinical trials and making sure that I have good understanding of trajectory of the illness. And I work with the compound. I, hopefully, develop what I call 'a feel for a compound,' meaning, I try to anticipate what will be the possible advancement.

Q: How complex is it for patients to be involved in clinical trials?

A: Most of the patients went under clinical trials for Alzheimer's, perhaps, even not looking for a cure. They have hope that they will get better, but most of them really want to contribute to the field. The altruism is a driving force in participation, not only in clinical trials for Alzheimer's but many other psychiatric or neurodegenerative disease. So patients look in this as an opportunity to contribute to the field. They have hope that they'll learn something and will get better. But most of them, including caregivers, want to contribute to the field. It's a very powerful motivator.

At this point, I really do not believe that it'll be one magic silver bullet that will solve all the complexity Alzheimer's. I also don't believe that, based on our knowledge of the disorder itself right now, that it will be one pharmacological agent only, which will significantly change the course of the illness or even less will cure this at all.

Q: Is there any evidence out there that's given you hope or at least a sign that your research is moving in the right direction?

A: We're definitely moving in the right direction. I'm very confident in that. My confidence is based on several recent changes. In 2012, we began using a compound. It is a pharmacological agent in a combination with fat, which allowed us to visualize amount of amyloid in a brain.

Previously, before that, there was a significant number of patients who entered clinical trials in Alzheimer's and did not have amyloid pathology. They had clinical presentation but might not have necessarily enough amyloid distribution in order for a drug to succeed. Those patients no longer will be able to participate in this type of clinical trial. In other words, we're making target population smaller, but it's more aligned with what a drug supposed to do. That's number one.

Then, we're learning about dosing. In some of the clinical trials, it is unfortunate but was used as one size fits all, one dose fits all. But if you have patients in very different decades of life, age of 50 to 85, most likely, one dose would not answer the complexity of this target population. I'm personally a proponent of multiple dosing, or dosing which will be derived based on more specific characteristic of the patient. Even the weight, for instance, would be something to consider. Those are incremental changes in design of methodology of clinical trials.

Q: What are your thoughts on environmental components playing a role in preventing or slowing down the progression of Alzheimer's?

A: I really think that environmental challenges of our life make some difference. The field of Alzheimer's, since we really didn't have much success in treatment, is moving now to the field of prevention. Active lifestyles, the ability to maintain a meaningful social relationship, physical exercise, maintenance of blood pressure and lipids and glucose and metabolism, prevention of depression and anxiety. All of that can play a role. I don't think this will prevent development of the illness as much I think it will push it to a different decade of life.

Q: What do you hope to accomplish for your Alzheimer's patients over the next 20 years?

A: I think in 20 years we will be able to come up with at least a number of pharmacological agents able to change the biology of the illness. That's number one. Then, in terms of prevention, I'm hopeful we will be able to come up with a vaccine. And before that, we need a biological marker for Alzheimer's to know who will receive the vaccine and start treatment earlier.

The brain is already affected by the illness. We're about 20 to 25 years behind the progression of the illness. What's important is to develop predictive biological markers in an identified cohort of patients who have a very high probability of developing Alzheimer's. And then introduce a vaccine to really change the trajectory of illness from very early on and attempt to prevent illness.

There are a number of attempts that were previously made to bring vaccines. All of them failed. But I think there's a new figure in that line of work based on advancements in clinical trials in the past 10 to 15 years.

Q: Why are you so passionate about Alzheimer's?

A: I think this is the area where we can really make a significant difference. I think a lot of patients are affected by that illness, and there is no cure for that. This is a frontier. We can make a substantial difference. My personal reason for my contribution is my mother died from Alzheimer's.