Book Review

Superb book about Alzheimer's disease

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ABSTRACT

The American physician and researcher Dale E. Bredesen's book *The end of Alzheimer's* from 2017 is probably the most important summary about this disease. It shows that there is justified hope of full recovery in early stages to Alzheimer's disease. For those who have already developed the disease, there is hope of significant improvement. The book is a well-written, popular scientific overview of the important approach Bredesen and his research group has worked with for the last few years. It should be read by all health conscious people, especially those who have passed 40 years, and professional neurologists and researchers will also benefit from it.

Few scientific papers have made me more impressed than Dale E. Bredesen's article on results with his ten first patients on his comprehensive treatment protocol [1]. These results were no less than sensational for people with mild Alzheimer's disease. They showed that the symptoms of 9 out of 10 persons with cognitive impairment were largely reversed. Later I have read several important scientific papers by Bredesen [2], and reading his overview book *The end of Alzheimer's* does not disappoint.

The point of departure for Bredesen – the scientific director of the Buck Institute for Research on Aging and professor of neurology at the University of California, Los Angeles – is this: Despite research that has cost billions of dollars to develop drugs against Alzheimer's disease, 99.6 percent of the drugs have not led to anything. As for the 0.4 per cent actually reaching the market, they are ineffective in stopping or slowing down disease development. Medications that have a certain symptomatic effect only work for a limited time. In other words, we need a completely different approach aimed towards the plaque which is deposited in the brain and that is typical of Alzheimer's disease. Had the "plaque hypothesis" (amyloid hypothesis) been correct, one would have reached the goal a long time ago since a number of drugs counteract the formation of plaque. However, they have no bearing on disease development, the affected ones are only getting worse despite less plaque.

Since the drug track has been and is a dead end, the prospects are bad for those affected by cognitive failure and subsequent Alzheimer's disease. Nevertheless, Bredesen points out unequivocally that the disease can be prevented and that cognitive failure can often be reversed. He has shown that this is possible through research and treatment. However, in order to reach the goal, it is required to use a comprehensive protocol tailored to each individual.

Bredesen's research has shown that Alzheimer's disease is not one disease but three main categories [3]. What we call Alzheimer's disease is in fact a result of protective mechanisms in the brain, and each of the three types is characterized by three different bio-chemical processes. Alzheimer's disease is a result of the brain trying to protect itself from three types of threats. The first is about inflammation due to infection, unhealthy diet or other causes. The second category is due to lack of access to or lack of important nutrients, hormones and other brain-supporting molecules. The

third category deals with protection against toxic substances such as metals or toxins produced by microorganisms, such as molds.

Bredesen's approach first removes the three main types of threats to the brain. Then the plaque must be removed before rebuilding the synapses that the disease has destroyed. When this is put into system, wonders happen to the cognitive processes of the patients. *The end of Alzheimer's* describes the protocol in detail, an approach Bredesen has called ReCODE (Reversal of COgnitive DEcline).

As a metaphor of Alzheimer's disease, Bredesen uses the analogy where a house has at least 36 holes in the roof, leaking through each hole makes it wet inside the house when it's raining. To counteract disease development, all 36 holes must be sealed. This is the essence of ReCODE, a comprehensive treatment protocol aimed at all variables that can be involved. However, each patient may not have as many as 36 holes. How many holes a patient has is decided only after extensive testing before treatment begins. The roof metaphor also shows why treatment with only one drug can never work.

Structure

The book consists of 12 chapters divided into four parts. In addition, the book has a number of appendices about food one should eat and key websites relevant to the topics listed in the book (Appendix A), details on the use of ketone meters (B), genetic testing (C) and a brief overview of how various details in the treatment protocol are scientifically substantiated (D). The book has chapter-ordered endnotes and an index. *The end of Alzheimer's* contains some well arranged black and white figures, some tables and text frames. Through the book, Bredesen presents short patient stories to illustrate academic points.

Chapters 1–6

Chapter 1 gives an overview of the topics and the book. Chapters 2–6 summarize the scientific journey that led to ReCODE, that is, the discoveries that form the scientific basis of the treatment protocol – what Alzheimer's disease actually is, where it originates and why it is so common. Chapter *2* describes Bredesen's first patient on the treatment protocol, while chapter 3 lists how it appears to have been demented, but to recover a healthy brain, based on one patient's accurate records. In chapter 4, Bredesen gives a recipe for how to live to get Alzheimer's disease – a tragicomic, but awareness-raising introduction.

Chapter 5 presents the scientific basis for understanding Alzheimer's disease. For three decades Bredesen and colleagues have developed a model based on extensive research on basic mechanisms, and this forms the biological basis for ReCODE. Here is also a summary of the resistance Bredesen has experienced from ethical research committees and granting authorities and persons for his research.

In chapter 6, the author gives an overview of the most important genetic risk marker for Alzheimer's disease, namely the ApoE4 gene. People who have inherited one such gene from both mother and father are at greatest risk of developing the disease, while those who inherit it from either mother or father only have an increased risk compared to those who have no such genes. Bredesen explains the mechanisms for how this gene contributes to disease development. In this chapter, he also presents the three main types of Alzheimer's disease.

Extensive testing

Chapter 7 describes all the tests that can be taken to clarify what might be the cause of cognitive failure or if one is in the risk zone to get it. The results of the tests provide a personal risk profile that defines the factors that individuals should take action against. The chapter not only provides an overview of the tests, but also explains the background for them. Put simply, this is about genetic factors, the degree of inflammation, the presence of infections and the blood level of the amino acid homocysteine and B vitamins. Furthermore, it includes measurement of fasting insulin levels in the blood and other hormones, cholesterol and other lipids, vitamins D, E and B_1. Should you be in doubt, it is a low cholesterol level that is associated with cognitive failure. Furthermore, the tests are about measuring the immune system's constitution and the influence of toxins and unwanted bacteria and other microorganisms that live in the intestine, mouth, nose and sinuses. In addition, the condition of the blood-brain barrier and the intestinal lining is tested. The blood-brain barrier will protect the brain from foreign matter, while the intestinal mucosa will prevent unwanted substances in the digestive tract from entering the bloodstream. Furthermore, it is investigated whether there is hypersensitivity to gluten and similar substances, antibodies to own tissues, mitochondria function, body mass index and the volume of different parts of the brain. In Alzheimer's disease, the volume of certain parts of the brain gradually decreases as the disease progresses. Furthermore, it is tested whether the person suffers from sleep apnea. In addition, this examination includes a variety of lifestyle factors, life-long environmental exposures, disease history and drug use.

Practical follow-up

Chapters 8 and 9 focus on what to do after completing this comprehensive testing. The first priority is to do something about the factors that need to be reversed to counteract or reduce the risk of cognitive impairment. That is, counteracting inflammation/infection, insulin resistance, lack of hormones and nutrients that support brain function, exposure to toxins, and replacement for and protection of lost or dysfunctional connections in the brain (synapses). Chapter 8 provides a detailed overview of what to do for each of the factors one has to manage, and in chapter 9, daily routines and details of how two specific patients have solved this are presented. One followed the protocol 100 percent, while the other only grabbed the most important. Both had success by following ReCODE. Bredesen emphasizes that it is important to grasp as many of the factors as possible, but that little is better than nothing. In addition, it is possible to start with a number of factors and add more as they manage to incorporate them into their daily routines. Bredesen makes it clear that it is most likely to succeed if you get into the disease process early and try to seal as many of the holes in the roof as possible.

Implementation, objections and criticism

In chapters 10–12, Bredesen explains the keys to achieving best results over time. Here he also addresses and answers questions and criticisms that have been addressed to ReCODE. Chapter 10 summarizes ReCODE, and Bredesen provides advice on how to implement such a comprehensive treatment plan. Chapter 11 presents and addresses all types of objections patients have had to avoid getting started with ReCODE. Chapter 12 summarizes and addresses criticism professionals have raised against Bredesen's comprehensive approach.

Evaluation

That *The End of Alzheimer's* went straight to the best selling lists of *The New York Times* and *Wall Street Journal* is not surprising. In addition to a highly important topic, it contains everything that a popular science academic book should contain. Here, in collaboration with the publisher, the author has done an exemplary job. The text is easy to read, and Bredesen uses all the way "images" to explain complicated physiology and biochemistry. That he spices the text with short patient stories makes the text vibrant and interesting. Also the book's layout is well arranged.

Bredesen has a very good overview of the literature after 30 years of research, and after working with over 200 patients on the ReCODE protocol by the time of publishing his book, he knows what he is talking about. In addition, over 800 people with the genetic risk marker ApoE4 have started to follow the protocol, with a website (www.apoe4.info) as a point of departure. These too have experienced the same as Bredesen's 200 patients. In late 2018, Bredesen and lot of collaborators published a paper with 100 more successfully treated patients [4]. Thus there is a lot of documentation that the protocol actually works, although formal randomized, controlled studies are not carried out so far. Remember that Bredesen's first professional article on patient results was not published until 2014, so the protocol is relatively new.

In Bredesen's opinion it's an open question whether aluminum is a causative factor for Alzheimer's disease, although other researchers believe published studies unequivocally show that aluminum is a causal factor [5, 6]. Here I am not convinced that Bredesen is right, but it is a detail anyway.

It is disappointing to get insight into all the resistance Bredesen has received from various quarters against his research. However, this is not unexpected: history shows that many of the most important medical breakthroughs have been strongly opposed and criticized in their contemporary times. Based on his scientific publications and *The end of Alzheimer's*, it seems that the "riddle" of what causes Alzheimer's disease is now resolved. These are big words, but I stand for them. Future research will surely make the model more nuanced, and clinicians will find out more about how the protocol can best be implemented. On the whole, it appears to be credible and durable – and it works in practice. I will not be surprised if Dale E. Bredesen in 10–20 years is awarded the Nobel Prize in Medicine or Physiology. However, this will only happen after the majority of physicians and scientists have been convinced that ReCODE actually works. In the meantime, you can read *The End of Alzheimer's* for as soon as possible to get tips on how to best prevent or counteract cognitive failure and development of Alzheimer's disease.

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