

The Role of Nutrition in The Treatment of Hyperinsulinemia and Insulin-Resistance

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ABSTRACT

At the start of the 20th century, disease was mainly caused by infectious agents. The top three causes of death were pneumonia, tuberculosis, and gastrointestinal infections. Improved public sanitation and advancement in antimicrobial agents have transformed this landscape. To-day, cardiovascular disease, cancer, and diabetes are the leading causes of death. Cardiovascular disease, type 2 diabetes, Alzheimer's, gout, acne, polycystic ovarian syndrome, hypothyroidism, erectile dysfunction, vertigo, and tinnitus are typically conditions termed as 'idiopathic.' However, a growing body of evidence suggests a common underlying cause – metabolic derangement resulting from chronic hyperinsulinemia leading to the end-point of insulin resistance. Virtually no medical specialty is immune to insulin resistance. Currently, there is no forum in our medical community to synthesize and unite the clinical research into a unified method that can be applied in treatment. To fight insulin resistance, the body multiplies the production of insulin to maintain healthy levels of blood glucose. This leads to high insulin levels in the bloodstream. Research tells us that this condition shows up almost thirteen years before the onset of many chronic diseases.

'You are what you eat' is a common saying and is technically accurate. What we eat, determines how we look, feel, and function. Nutrients from foods we eat provide the foundation for all cells in our body. Every cell in the body has a shelf life, ranging from a day or two for a stomach cell, to four months for a red blood cell. The nutrients we provide our body, and the time we offer them, become the basis for the integrity of our health's foundation. Although we may not realize it, every moment, we are constantly repairing, healing, and rebuilding our bodies. Eating a clean, nutrient-rich diet, combined with appropriate supplements when needed, and the right homeopathic remedy can help us heal more quickly.

Keywords

AMPK, Diabetes Mellitus Type 2, Homeopathy, Hyperinsulinemia, Insulin resistance.

Introduction

At the start of the 20th century, infectious diseases were the primary cause of illness and death - specifically, pneumonia, tuberculosis, and gastrointestinal infections. Improved public sanitation and breakthroughs in the development of antimicrobial agents transformed the landscape. Several of these once-formidable conditions now became easily treatable. By the 21st century, diabetes, cardiovascular diseases, and cancer became the leading causes of death. With the explosion of knowledge in the field of

genetics, the power of our genes became clear in our susceptibility to disease. However, genetics alone is not the primary cause of the meteoric rise of many of the common conditions we recognize today. Our 'unlucky genes' are not always to blame – modern lifestyle choices derail many metabolic processes. Poor diet, disrupted sleep rhythms, excessive consumption of substances, and other such factors, create a misalignment between the dietary and environmental landscapes humans are physiologically adapted to and the ones they chose to live.

Thus, fertile ground is created for a variety of ailments. Diabetes Type 2, gout, Alzheimer's, acne, thyroid complaints, cardiovascular diseases, erectile dysfunction, and polycystic ovaries are all typically considered idiopathic. The problems of

hyperinsulinemia and insulin resistance are far more significant than is currently recognized. According to the most recent publication of The Journal of Insulin Resistance, both in medical literature and clinical practice, insulin resistance is primarily discussed in the context of Diabetes Type 2, and rarely outside of that. A large and continually expanding body of research suggests that insulin resistance is the corner-stone of a unifying theory of chronic disease. The diseases that are stemming from this condition are so vast that they can almost bankrupt our nations. The current treatment paradigm is not working, and we urgently need a new methodology that is quite different from what we currently use. This paper strives to highlight aspects of this condition that are less common and increase awareness so that treatment can be targeted correctly towards healing.

Before we begin to take an in-depth look into this topic, let's start by understanding this condition. Insulin resistance is a term that was coined in 1936. It describes a metabolic disorder characterized by a diminished cellular reaction to insulin. This reaction is especially true in insulin-dependent tissues of the liver, bone, and fat cells.

Population affected and treatment cost

Based on the most currently available data, one in three people in the UK, and one in two in the US are affected. Another two million are likely undiagnosed in the United Kingdom, and seven million in the US. This census, although most currently available, was conducted in 2015 - so these numbers are likely to have risen significantly since then. In this last year alone, this number has increased by 100,000 and continues to grow at an alarming rate.

The most common condition stemming from insulin resistance is Diabetes Type 2. Here is a look at how much we spend on just this disease condition alone. An estimated £14 billion is spent yearly on treating diabetes in the UK. That is twenty-five thousand pounds every minute. In the US, \$245 billion is spent annually on diabetes. An average American spends about four-teen thousand dollars per year on medical expenses related to this condition.

Diagnostic criteria based on Mayo Clinic USA

Diabetes Mellitus type II is diagnosed with a glycated Hemoglobin test - HbA1C or A1C as it's also called and indicates a 3-month average of blood glucose.

Other tests used are:

Random blood sugar test – a reading of 200mg/dl or 11.1 millimoles
Fasting Blood sugar test - a reading less than 100 or 5.6 is desired
Oral Glucose tolerance test –

- 140 mg/dl (7.8 mmol) is normal
- 140-199 mg/dl (7.8 to 11 mmol) pre-diabetic
- 200 (11.1) or higher 2 hours after eating indicates diabetes

The American diabetic association recommends routine screening for type II after the age of 45.

Signs & Symptoms

The main signs of diabetes are:

Polyuria or frequent desire to urinate
Polydipsia or excessive thirst and fluid consumption
Polyphagia or excessive hunger

Common Symptoms

Increased thirst
Frequent urination
Excessive hunger
Unintentional weight gain or weight loss
Fatigue
Blurred vision
Slow healing wounds and bruises
Hands/feet that can become numb with pain or tingling
Tender, red gums with swelling

Pathophysiology

In a healthy individual, the pancreas (an organ of the digestive system, located in the abdomen behind the stomach) performs the endocrine function of secreting digestive enzymes, and hormones - specifically, insulin and glucagon, to control the amount of glucose in the blood-stream. The release of insulin lowers the blood sugar, and glucagon raises it. Insulin levels peak at about 20 minutes after a meal and drop to their lowest 2-4 hours after. Hyperglycemia or high blood sugar is a defining characteristic of all types of diabetes. In the past, Diabetes Type 1 was far more common; today, 90% of all Diabetes is Type 2. It used to be typically an adult illness, but with increased childhood obesity, this has become an epidemic across all ages. In Type 1 Diabetes, there is a lack of insulin; whereas in Type 2, there is often hyperglycemia, stemming from insulin resistance – which is the body's inability to absorb the insulin and lower the blood glucose. The body initially produces more insulin to fight this resistance, leading to high insulin levels in the bloodstream. This reaction is called hyperinsulinemia. Research tells us that this condition in adults often shows up almost 13 years before the onset of most major diseases. Insulin resistance develops from the gathering of visceral fat inside and around organs.

Phases of cycle

The liver is the first significant organ affected. This is referred to as the hepatic cycle. Next is the pancreatic cycle, resulting in a fatty pancreas, leading to beta cell dysfunction. Increased levels of fat lead to decreased energy production, high triglyceride levels, high blood pressure, and overworked kidneys from fluid retention. This metabolic syndrome becomes a base ground for all other health conditions. Research tells us that high insulin levels in the bloodstream are far more damaging than elevated blood glucose.

Complications

Diabetes is a chronic disease that affects the entire body. Complications can affect either micro blood vessels or macro blood vessels. When small blood vessels are damaged, it progresses to chronic kidney diseases and eye problems. When larger blood vessels are damaged, it results in atherosclerotic plaque formation, narrowing of arteries - causing strokes, heart attacks, gangrene of the legs, or other macrovascular diseases.

Other possible complications include fatty liver disease, PCOS, skin conditions, Alzheimer's, cancer, erectile dysfunction, bladder complications, and digestive disorders (like nausea, constipation, diarrhea, orthostatic hypotension, and eventually diabetic coma).

Existing Paradigm

For a very long time, BMI and obesity were considered the mainstays for many chronic conditions. However, there are millions of people of average weight who experience these very same conditions. They may be thin but have either a decreased high-density lipoprotein cholesterol or have a higher abdominal circumference (a larger weight-to-height ratio). Today such people are referred to as skinny fat. Research also suggests that the build-up of adipose tissue may be due to the insulin resistance rather than insulin resistance always being attributable to weight gain. In the same vein – obesity is one primary marker attributable to insulin resistance. Not everybody with insulin resistance needs to be overweight or have the very same marker.

Lifestyle

The 1950s saw an increase in heart attacks. Dietary fat was believed to be the culprit. Low-fat diet recommendations began and led to increased consumption of high carbs. By the 1980s – 108 million people globally had Diabetes. By 2014, that number had reached 422 million. In the past, Diabetes Type 1 was more common, but by 2016, only 10% of all Diabetes was Type 1. The majority of patients with Diabetes today are obese, and the levels of obesity in the world are growing at an alarming rate.

In 2009, Dr. Lustig, a leading endocrinologist from California, increased awareness of the harmful effects of sugar. However, one key element was missed - fructose. The body does not consume fructose like sugar. Instead, it is digested by the liver. Its overconsumption leads to the formation of a fatty liver. Initially, fructose was gained from fruit and considered harmless. However, the advent of cheap high fructose corn syrup as a flavor enhancer led to most processed foods containing it. Today, research tells us that it impacts the brain in almost the same way that addictive drugs do. Limiting consumption seems the obvious answer. This is next to impossible, as it is lurking in nearly everything commercially manufactured. So, reading food labels in a very discerning manner is critical to avoiding this additive. Further, once a hepatic cycle has resulted in a fatty liver, the consumption of fructose from fruits that were once considered harmless causes spikes in blood sugar similar to pure cane sugar.

Holistic approach in treatment

The two leading causes of insulin resistance are lifestyle and genetics. This is where I focus my attention in treatment. TV Programs like the 'Biggest Loser' pit contestants against each other as they fixate on the reduction of calories and exercise. In extreme cases where bariatric surgery has been performed, it has been found to quickly decrease or even reverse the condition of diabetes as it forces involuntary fasting on the patient. When they go off the diet or stop the exercise, the problem returns reasonably quickly. After bariatric surgery, 25-30 % of participants gradually gain the

weight back.

What is useful is when a patient can maintain their basal metabolic rate, both before and after a diet, so they don't return to their old diet. The food we eat determines how we look, feel, and function. If we sleep well at night, if we are shaped like an apple or a pear, whether our brain will use glucose or ketone bodies to get energy, or for a woman, her chances of getting pregnant, are all examples. In short, the right nutrients and food combinations will help us live longer and healthier, while the wrong ones could shorten our lives and increase sickness. Other factors, especially genetics, can always play a part as well.

Chronic calorie restriction has been shown to reduce the risk of many diseases, while constant and extreme diets over long periods can severely negatively impact health. We also know that chronic hyperinsulinemia promotes systemic inflammation. This inflammation decreases the enzymes responsible for the breakdown of all fatty acids. It is essential to be aware that this process begins in the gut and then gradually spreads to all other systems such as atherosclerosis in cardiovascular diseases.

In diabetes prevention and treatment, maintenance of healthy body weight is needed. So how is that achieved? How do we shed the weight that has been gained, safely, without lowering our basal metabolic rate? To understand what good health is, an in-depth look at the diet and lifestyle factors related to the centenarians of the Blue Zone cultures of Okinawa in Japan, Ikaria in Greece, Calabria, and Sardinia in the Mediterranean, Loma Linda in California, Costa Rica in South America is necessary.

Although these cultures are very diverse, there is still much overlap. There are some key take-aways we can derive from them. Some common factors between these cultures are listed below:

- They ate a plant-based diet high in nuts and some fish.
- A diet low in protein, sugar, saturated and trans fats.
- A diet rich in complex carbohydrates.
- They frequently consumed two meals a day, and sometimes a 3rd light meal.
- They never ate after dark.
- Their regular physical activity included: walking, gardening, martial arts, and dancing.
- They did not take on much stress and instead lead a life with spirituality, religion or a familial outlook.
- They fasted frequently – either for religious reasons, or natural causes.
- These people were resilient, both emotionally and physically.
- They limited their protein intake. To apply that with today's knowledge of nutrition, consumption should be between 0.31 to 0.36 grams per pound of bodyweight.

A critical aspect that stands out here for good health is fasting. Intermittent fasting regularly, and fast mimicking once a quarter is essential. Fast mimicking may need medical or nutritional supervision for safety reasons. Fasting not only helps shed the extra weight but having these long gaps between eating, gives the

digestive system a much-needed rest.

The release of IGF-1—a growth factor is triggered, and that helps with the regeneration of dam-aged cells.

Exercise is another critical point that works in partnership with proper nutrition to keep us healthy. Regular exercise, ideally an hour a day, 5x a week is needed to keep us in good stead. However, with the busy lives we lead, exercise for a minimum of 20 minutes preferably soon after every meal (and more on days when time permits) works well to control high blood sugar. The idea behind this approach is to lower the sugar level when the insulin spikes after a meal. Exercise could be as simple as taking a walk around the block soon after lunch at work, rather than trying to squeeze in time to visit a gym.

Here are a list of herbs and foods, some consumed naturally as part of a regular diet in the blue-zone, or as supplements to control sugar and insulin resistance:

- Bitter melon – lowers blood glucose
- Bilberry extract – repairs ocular damage
- Aloe Vera – speeds up wound healing
- Cinnamon Bark – lowers bad cholesterol/post prandial blood sugar
- Fenugreek – digestion regulator
- Ginger – gut health, sugar regulation
- Okra – gut health, digestion, sugar regulation
- American Ginseng - lowers blood glucose
- Berberine - found to work almost as well as the popular metformin.
- Fish oil - helps with insulin sensitivity
- EGCG from green tea - lowers blood glucose

Genistein – mainly found in soya beans – improved hyperglycemia
Apple Cider vinegar – with the mother lode – lowering sugar and gut inflammation

Gymnostemma or otherwise called Jiaogulan or Southern Ginseng – reduces gut inflammation

Red rice yeast - natural statin to lower cholesterol

Rooibos - lowers blood glucose

Ketone Salts – help use ketones for energy

Some of the herbs listed here can trigger the release of AMPK or Adenosine Monophosphate Protein Kinase. In layman's terms, it activates the release of certain enzymes that all of us make; some of us make more and some less. Production of AMPK naturally declines with age, or when the body is not healthy. Increased production of this enzyme can help restore gut health by decreasing systemic inflammation. Reduced inflammation leads to improved energy and glucose production while simultaneously reducing insulin sensitivity. Weight loss can be a by-product, especially around the belly, which helps decrease insulin resistance.

The second and crucial aspect of the treatment of insulin resistance is genetics.

While many of these lifestyle changes and supplements can be

used to lower blood sugar and what appears to be, at times, reverse the disease. In reality, this effect is only temporary. Why may we ask? Our DNA contains genetic information. Although every single DNA is not unique, the sequence of pattern variation is. No two sequences are identical – although there can be similarities among family members. When stressors affect our lives, we don't manifest the effect in the same manner.

Let's say we take five people whom all lead stressful lives, possibly even facing the very same stressor. One could end up with poor gut health, one with skin problems, another with sleep issues, one with anger management problems, and yet another with depression or anxiety. Consider the biometrics of our fingerprints – no two are alike. The same is true for iris scans – each is different. Shouldn't medical treatment plans also be unique to each individual?

History of Homeopathy

The homeopathic system of medicine existed before the time of Hippocrates. Homeopathy was introduced in America, after its success in treating the cholera epidemic of Europe in 1832. It was discovered in the 1800s by a German Physician, Samuel Hahnemann, and spread quickly to many countries. America was, in fact, the leader in the early 1900s with twenty-two homeopathic medical colleges, and fifteen-thousand qualified doctors practicing homeopathy. The first full-fledged homeopathic hospital was in Ohio. However, the growth of the pharmaceutical industry, its alliance with the American Medical Association, the release of the Flexner reports, and the lure of a quick fix for ailments led to these colleges and hospitals being shut down. The reasoning provided was that they did not meet scientific standards.

Homeopathy remained alive and well in many countries in the world, with India being the current leader. India has a hundred and eighty homeopathic colleges and four hundred homeopathic hospitals operational today.

Homeopathic Treatment

It is a safe, gentle, natural system of healing that works by stimulating the body to heal itself. A homeopath believes that the body is always striving to keep itself healthy. The force or energy in the body is referred to as the Vital Force. The body's method of communicating is by producing signs and symptoms. Some simple everyday examples are - fever, pain, mucus, or cough. These symptoms, although unpleasant for the patient, are signs of a healthy defense mechanism and should not be suppressed. Suppressing symptoms drives the disease deeper into the body.

A homeopathic approach views all parts of the body-mind, emotions, physical as interdependent, rather than separating body parts and treating them as entities. Taking a case for a homeopath is both an art and a science – it requires eliciting all the necessary information about their complaints and can be as exacting as a Japanese tea ceremony! Every individual is different in health as in disease, and so giving importance to all these unique expressions helps a homeopath arrive at the soul of the case. In my practice, when I see a client, I spend a fair amount of time to try

and understand their health concerns, as well as their personality. I go back in time to look at their life in chunks of time starting from childhood, often starting well before the onset of disease. This gives me both a bird's eye view and a very in-depth look at their life and health. I ask for recent medical reports regarding their issues as it gives them and me a good baseline to begin treatment. Once I have thoroughly understood their complaints and symptoms; I tailor a program unique to them. This frequently involves diet and nutrition, yoga or meditation, counseling, along with the appropriate homeopathic remedy indicated. Homeopathy has no side-effects, choosing the correct treatment in the right potency triggers its primary action of stimulating the body. It is the subsequent action that the body performs, which generates the cure.

Genetics

Now, let's come back to genetics. How does Homeopathy play a part in that?

Hahnemann found in his experience, that while acute diseases responded quickly to homeopathic treatment and were easily cured; chronic diseases created many more challenges. Either symptoms recurred, there were many ups and downs, or he faced significant setbacks. For twelve painstaking years, he worked on understanding why this was happening. This exploration led to the birth of the concept of 'miasms' in homeopathy.

The word miasm technically means, to taint or pollute, and is a broad topic. Without delving into too much detail, it is the hereditary predisposition that makes one vulnerable to specific diseases.

Factors such as stress, diet, and lifestyle are triggers to wake up this predisposition. By managing the sugar intake in a variety of ways, we may be able to improve the diseased state. However, this does not address the miasm that has been triggered. Until and unless this miasm is restored to dormancy, health cannot be permanently repaired. We could liken it to a metaphor, wherein a dragon has been awakened, and we desperately want to put it back to sleep instead of letting it extend its influence throughout our lives.

Criticism of Homeopathy

You may ask: If Homeopathy is such an effective system of treatment, why aren't more people following it? Why is there so much criticism about this methodology? Is it just a placebo effect? For many years, naysayers dismissed homeopathy as a pseudoscience, as the dilutions did not contain any medicinal substance according to lab tests. To understand this at depth, we need to delve into some chemistry - specifically, Avogadro's number. According to this principle, there can be absolutely no molecules of the original substance in any homeopathic formulation higher than a 12C potency. This leads me to Dr. Jayesh Bellare, a leading scientist with a background in chemical engineering from the Indian Institute of Technology, Mumbai - India's top University. He utilized Nano Technology and discovered particles of the original substance all the way up to a 10M potency. He repeated the tests several times to get the same conclusive results. Dr. Bellare

is not a homeopath, nor has he ever taken so much as an Arnica himself. He decided to conduct these tests based on the suggestion of a friend. When he initially wanted to publish these results in scientific journals - he met with total ridicule. The word homeopathy mentioned in his article was sufficient to get him rejected! Now bear in mind, Dr. Bellare is a distinguished scientist who had already published 66 articles in a variety of prestigious scientific journals. Ultimately the article was published in a respected research journal called Lang-muir, published by the American Chemistry society in 2012. According to Dr. Bellare, sadly this article acted as a vaccination against any future publication both by him or his students on this topic, and he had no idea what kind of rabbit hole he had fallen through.

Science can broadly be classified into three types; experimental, inferential, and observational. The world of science places much more importance upon the first two types, rather than on the third variety. The primary two types are conducted in a lab with clear guidelines and can be repeated to produce and verify the same results. Homeopathy, however, being an observational science, works on treating disease by identifying the unique peculiarities in each person. This is tough to reproduce and verify in a lab. Many observational studies have been conducted on homeopathy but end up more as empirical studies. Subjects such as homeopathic satisfaction, comparison of the use of anti-depressants with homeopathy and placebo are the types of conducted studies. Many begin as more extensive, longitudinal, cross-sectional studies - but often on tiny budgets. Sometimes participants drop off, or people documenting these numbers quit, new hourly workers/ or research students enter the picture who don't have much knowledge on the topic. Data is not collected or tabulated correctly, and the results reflect a poorly executed study and do not merit scientific scrutiny.

Scientific Support in favor of Homeopathy

In July of 2018, Lord Aaron Kenneth Atherton, a senior consultant of Integrative Healthcare in the UK, organized a scientific seminar at 1 Wimpole Street, London; the residence of the Royal Society of Medicine. The seminar was called: The New Horizons in Water Science - The Evidence for Homeopathy. Six prominent speakers presented their findings in favor of homeopathy that they discovered through their scientific experimentation. Here is a look at this eminent list and their research findings:

1. Professor Emeritus Brian Josephson, Nobel Laureate in Physics, 1973, Cambridge University. The focus of his talk was on how chemical interactions take place. Based on more recent scientific findings, we would need to revise what we know - especially based on research in quantum theory that would apply to understanding how homeopathy works.
2. Professor Luc Montagnier, Co-Nobel Laureate, 2008 - AIDS Virus. He has become an authority on water science, and here are his own words on homeopathy: "High dilutions are not nothing; they are water structures that mimic the original molecules. It's not pseudoscience. It's not quackery. These are real phenomena which deserve further study".
3. Professor Jerry Pollack, 1st Emoto Peace Prize Winner,

University of Washington. Professor Pollack presented on 20 years of research in the field of 'Exclusion Zone Water,' which is a phenomenon at the boundary between hydrophilic materials and water. This topic is especially pertinent to homeopathy as it possibly explains the structuring of water molecules in homeopathy that has so far remained inexplicable by conventional science.

4. Dr. Vladimir Voeikow, Biorganics Expert, Moscow University – Member of Russian Academy of Natural Sciences. Dr. Voeikow explained how a key-lock mechanism of molecular biology is very outdated. Similar to the difference between old fashioned hotel keys and the new electromagnetic variety; homeopathy is the science of the future. He went on to describe over a hundred experiments that have been conducted that show the existence of biological material in homeopathic dilutions. These experiments and the results have been published in Russia.
5. Professor Alexander Konovalov, Doctor of Chemistry, The Russian Academy of Sciences. Professor Konovalov spoke about the existence of biologically active substances present in water-based nanostructures that are a part of homeopathic dilutions.
6. Dr. Jayesh Bellare, Department Head of Chemistry, IIT Mumbai. He presented a theory on the homeopathic method of action based on nanoparticles, explaining how Nano-doses worked in homeopathic dilutions.

Conclusion

The organization of such a seminar sent shock waves through the scientific community. However, delegates from over twenty different countries participated in listening to these eminent scientists deliver incredible evidence to support homeopathy. None

of them are homeopaths or even advocates of homeopathy. They merely shared what they discovered through their research, in their respective scientific domains. Despite the compelling evidence supporting the existence of medicinal value in homeopathy, the broader medical community continues to dismiss it. Homeopathy is not a choice of treatment in the majority of the fifty states in the USA, nor does the NHS support it in the UK anymore. Increasing knowledge through awareness is much needed to bring back this powerful system of healing, as a choice of treatment for people.

References

1. www.hri-research.org/2018/08/new-horizons-in-water-science-evidence-for-homeopathy/.
2. Buettner, Dan. The Blue Zones: 9 Lessons for Living Longer from the People Who've Lived the Longest. National Geographic. 2012.
3. Crofts, Catherine Ap, et al. "Repeatability Characteristics of Insulin Response Patterns and Measures of Insulin Resistance." *Journal of Insulin Resistance*. 2019; 4:1.
4. www.dietdoctor.com/authors/dr-jason-fung-m-d.
5. Fung, Jason. The Obesity Code: Unlocking the Secrets of Weight Loss. Greystone Books. 2016.
6. Fung, Jason, Nina Teicholz. The Diabetes Code: Prevent and Reverse Type 2 Diabetes Naturally. Greystone Books. 2018.
7. www.dietdoctor.com/intermittent-fasting
8. www.vithoukas.com/
9. www.healthpromoting.com/learning-center/videos/dr-alan-goldhamer-success-plant-based-sos-free-diet.
10. www.mayoclinic.org/.
11. Shanahan, Catherine, Luke Shanahan. Deep Nutrition: Why Your Genes Need Traditional Food. Flatiron Books. 2018.
12. The Longevity Diet. Penguin Random House. 2018.