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Integrative medicine – healthy ageing

D.P. van Velden* and M.J. Kotze
Faculty of Medicine, Department of Pathology, University of Stellenbosch, Tygerberg, South Africa

1. Introduction

Integrative Medicine is defined as a post-modern healing-oriented medicine that reaffirms the importance of the relationship between practitioner and patient. All appropriate therapeutic approaches, both conventional and alternative/complimentary informed by evidence are explored with a focus on the whole person (body, mind and spirit). To achieve optimal health the principles of Functional Medicine needs to be applied to address the underlying causes of disease, using a systems-oriented approach and engaging both patient and practitioner in a therapeutic partnership [1].

In the South African context Integrative Medicine includes modern Western (allopathic) medicine, various recognized alternative and complementary models, traditional healers, lifestyle medicine, functional medicine, and the therapeutic doctor/patient relationship. Integrative healthcare services demand interprofessional collaboration between bio-medically trained doctors and traditional, complementary and alternative practitioners to facilitate the process.

The main reason for developing integrative healthcare was the increased demand for holistic care from patients. The doctor is expected to provide care that is patient-centered and comprehensive by incorporating high-tech genomic information, systems biology, and functional medicine into routine clinical practice. The doctor of the future will become an integrative healer whose practice differs in many ways from that of today's typical physician. Patients will increasingly take responsibility for their own health, with medical care focused more extensively on preventing disease and injury.

*Corresponding author: D.P. van Velden, Faculty of Medicine, Department of Pathology, University of Stellenbosch, Tygerberg, 7505, South Africa. E-mail: dpvv@sun.ac.za.

2. The patient as partner in the healing process

It is important that the patient must be seen as a whole, consisting of physical, intellectual, social, emotional and spiritual elements. This person does not live in isolation, but is influenced by environmental, genetic, biological, occupational and emotional influences that may both enhance or destroy health. To a greater degree, these influences may be manipulated to promote health and wellbeing. It is obvious that this goes well beyond the scope of the physician, and involves a whole team of health workers with interprofessional collaboration.

In nearly all of the sciences, even the physical ones in which we put so much faith today, it is obvious that what we call knowledge today will almost surely be discarded tomorrow as approximations of the truth. The true knowledgeable man is not the one that knows all the answers, but who question the answers. The field of quantum physics and genomics has challenged our long held views about physical and living matter.

"*Judge a man by his questions rather than his answers.*" - Voltaire (1694–1777)

So-called scientific laws were not incorrigible truths about the world after all; they were theories, and as such they were products of the human mind. If they worked well in their practical application then that meant they must approximate to the truth, yet it was always possible, even after hundreds of years of pragmatic success, for someone to come along with a better theory that was closer to whatever the truth was.

"*Science is perhaps the only human activity in which errors are systematically critized and, . . . in time, corrected*" - Karl Popper (1902–94)

Although we do not know for example, how acupuncture works, we cannot ignore the fact that acupuncture does have curative effects for certain medical conditions. The fact that we do not know the

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mechanism of action does not mean that it does not work because it cannot be scientifically 'explained'. It is by continuing questioning that we may one day arrive at the explanation – this is the very essence of science.

To a great degree, the body has the capacity to heal itself; this concept, in some ways, opposes the mechanical model in which doctors may cure the disease. One goal of future practitioners will be to guide and empower patients toward self-healing. Ultimately the patient is motivated to take responsibility for his or her own health, and becomes a partner with guidance by the health practitioner in the healing process. Consonant with this approach will be the use of disease prevention and health promotion, the full range of natural treatments, use of the safest and least expensive interventions first, and also the mobilizing of community and social support for healthy living. Emphasis in primary care is on Community Actions dealing with health education and promotion, active and healthy ageing, health maintenance, motivation for healthy lifestyle, and less invasive and more cost effective treatment of illness.

3. The burden of chronic and degenerative diseases

We know with certainty now that rapidly rising rates of complex, chronic disease are creating an unsustainable burden on the national economy in both direct (e.g., treatment) and indirect (e.g., lost productivity) costs. These chronic and degenerative diseases cannot effectively be treated with drugs alone. As a matter of fact, chronic drug use for these conditions is not only costly, but often has serious side effects. Popular analgesics and nonsteroidal anti-inflammatory drugs (NSAIDs) such as celecoxib, diclofenac, ibobrufen, naproxen and aspirin, have confirmed risk for heart disease and internal bleeding. Paracetamol can damage the liver. Allopathic medicines often do not cure the disease, but rather mask the symptoms, and sometimes just stop us from dying.

Integrative medicine is a model of comprehensive care and primary prevention for complex, chronic illness that is grounded in both the science and the art of clinical medicine. No longer is the patient seen purely through the lens of a dysfunctional organ system, a disease, or a syndrome. By evaluating a matrix of root causes in the diagnostic and therapeutic process, we open our eyes to a different vertical as well as horizontal way of thinking about complex and chronic disease states.

"*The art of medicine consists of amusing the patient while Nature cures the disease*" - Voltaire (1694–1777)

4. The limitations of acute care allopathic medicine

Few morbid conditions could be interpreted as being of the nature "one microbe, one illness"; rather, there are usually multiple interacting causes and contributing factors. Thus, obesity leads to both diabetes and arthritis; both obesity and arthritis limit exercise capacity, adversely affecting blood pressure and cholesterol levels; and all of the above, contribute to both stroke and coronary artery disease. No single drug can treat these underlying functional disturbances on its own.

Medical practice is formulated on the best available evidence. One of the most important reasons for the use of unconventional therapies is concern about the side effects and costs of orthodox medical treatments, and the fact that unorthodox practitioners generally spend more time on lifestyle, education and the therapeutic relationship. In allopathic medicine, drug interventions have been studied more extensively than non-pharmacological interventions, in part due to the technical and methodological difficulties in the design of randomized-controlled clinical trials (RCTs) for non-drug interventions (and, in part, because of the non patentable nature of most lifestyle interventions). This situation creates a significant problem in primary care, where the use of educational, dietary, and lifestyle interventions is attractive because of their resonance with the principle of "maximum effect using minimum resources."

It is not enough, however, to demonstrate, as many experts have done, that the majority of today's chronic diseases could be prevented or ameliorated by changes in lifestyle, and then suggest that patient responsibility and self-care can take care of the problem. We must also ask what contributes to such unhealthy lifestyles and how can we best equip clinicians to serve the patients who are living every day under those pressures. We will have to look more closely to functional disturbances underlying clinical imbalances, as well as the social and institutional factors contributing to the sense of loss of wellness. Nearly all the top ten selling drugs are for conditions that are significantly amendable to lifestyle modification. The question is whether we are

treating illnesses we should be preventing, or do we have to deal with the "worried well" syndrome where reassurance is all that is necessary to restore wellbeign.

5. The search for safer and more natural plant-based phytonutrients for treatment

"*Let your food be your medicine and let your medicine be food.*"

- Hippocrates, c. 460 BC-c. 377 BC

It almost goes without saying that we are what we eat – but it is perhaps less obvious that we are also what our predecessors have eaten throughout the evolution of our species. One doesn't have to be a rocket scientist to realize that food can prevent and treat disease. Indeed – food is medicine. The traditional Mediterranean diet (typically rich in olive oil, fish, vegetables, beans, lentils, fruit, and red wine, and low in potatoes, red meat and dairy products) has been known for the past 40 years to be particularly healthy. We know that disorders such as obesity, diabetes, high blood pressure and heart disease are genetically inherited, but lifestyle largely determines who will become ill and when.

The modern Western-type diet is deficient in fruits and vegetables and contains excessive animal products, generating the accumulation of non-metabolizable anions and a lifespan state of overload metabolic acidosis, whose magnitude increases progressively with ageing due to the physiological decline in kidney function. In response to this state of diet-derived metabolic acidosis, the kidney implements compensatory mechanisms aimed to restore the acid-base balance. These adaptive processes lower the urine pH to maintain homeostasis. Even mild degree of metabolic acidosis induces skeletal muscle resistance to insulin action and dietary acid load may be an important variable in predicting the metabolic abnormalities and the cardiovascular risk of the general population including diabetes, chronic kidney failure and osteoporosis. The acidogenic Western-type diet is the result of the insufficient intake of fruits and vegetables to compensate the acidifying effect of meat and other dietary components [2]. This compensated metabolic acidosis has been associated with cancer, diabetes atherosclerosis, chronic fatigue, osteoporosis, arthritis, inflammatory bowel disease, rheumatoid arthritis, obesity, metabolic syndrome and fibromyalgia, just to name a few.

There is substantial evidence that even chronic inflammatory diseases such as asthma and rheumatic conditions, as well as cancer and arthritis, immune disorders and female infertility, have a great deal to do with the kind of food we eat. It is well-established that by increasing the intake of foods high in omega-3 fatty acids, together with antioxidant-rich foods, while reducing omega-6-fatty acids, trans fats and high-glycaemic carbohydrates, we can redress the balance and reduce the inflammatory response. Some people have a genetic predisposition to becoming insulin resistant, but the eating and exercise habits determine whether they will actually develop diabetes.

Chronological ageing is unavoidable and equal for all. Biological ageing on the other hand is the result of the way we choose to live our lives. The invisible symptoms of ageing can be devastating, but even degenerative diseases of the brain and eyes can be prevented and to some extent improved by choosing the foods your body needs and avoiding those that will certainly make matters worse.

6. Personalized medicine

Personalized medicine can be described as the effort to define and strengthen the art of individualizing health care by integrating the interpretation of patient data (medical- and family history), symptoms and signs of disease, with emerging "–omic" technologies—nutritional genomics, pharmacogenomics, proteomics, and metabolomics. This approach was already emphasized by the great Sir William Osler during the previous century:

If it were not for the great variability among individuals, medicine might as well be a science, not an art. It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has. The good physician treats the disease; the great physician treats the patient who has the disease" *—Sir William Osler, 1892*

Scientists have learned that DNA can tell us a great deal about our risk factors for certain diseases. Since the sequencing of the genome was completed in April 2003, scientists can determine genetic risk factors for disease more accurately. The clinical usefulness of founder mutations that may explain the high prevalence of certain single-gene disorders in a population is known for many years. More recently the value of common minor genetic variations has also been recognized due to their role in metabolic pathways shared by a wide spectrum of chronic, non-communicable

diseases [3]. Genetic testing is becoming an important part of diagnosing and treating disease to facilitate risk management targeted at gene-diet interaction (nutrigenetics) and to optimize treatment response (pharmacogenetics).

Although the genome indicates the likelihood of getting disease, it does not tell you whether you actually have it. Identification of the specific proteins as biomarkers goes one step beyond the genome; proteomics may indicate the presence of a disease. This kind of individualized medicine based on a detailed personal and family history, personal genomic and proteonomic map will revolutionize medicine of the future. It is critical that we understand the effect of conditions beyond the control of individual patients—not only the genetic vulnerability one is born with, but increases in environmental toxicity, the homogenization and denaturing of the food supply, the influence of sedentary technology on jobs, education, and entertainment, the powerlessness and despair of poverty, the debility produced by chronic stress, and the fragmentation of family and community life that leads to isolation and a lessened sense of purpose and meaning. Modern farming practices using pesticides and early harvesting before ripening, have an influence on the nutritional value of produce.

7. The Angelina effect

The Angelina Jolie revelation has sparked a welcomed public discussion about the benefits of genetic testing. Mutations of the BRCA1 and BRCA2 genes have been linked to hereditary breast and ovarian cancer. Jolie lost her mother Marcheline Bertrand to ovarian cancer at 56. A genetic screening test determined that she carried a genetic mutation in the BRCA1 gene that increased her chances of developing breast cancer to more than 80% and ovarian cancer risk of 50%. Mutations in the BRCA1 and BRCA2 genes account for less than 10% of breast cancer. She underwent a preventive double mastectomy after learning that she carries a mutation of the BRCA1 gene. It is estimated that her cancer risk fell from 87% high to less than 10%.

Genetic counseling is very important if someone considers cancer genetic testing. Pre-test genetic counselling is performed to determine a risk score of probability to detect a BRCA mutation, applicability of different testing options, the implications, benefits and risks, as well as psychosocial implications of the test. Post-test genetic counselling is performed once the test result is available, to interpret the information in the context of the family history and advise on appropriate options for risk reduction.

Cancer is an intricate and potentially lethal collaboration of genes gone awry, of growth inhibitors gone missing, of hormones and epigenomes changing and rogue cells breaking free. While science cannot do much to change the genome, epigenetic functions are manipulated all the time by exposure to environmental chemicals and by drugs. If the malignant signaling can be silenced or reversed, the cancer is not able to spread. Drug agents are being developed to target specific genetic mutations. Some seek to reactivate the body's immune system, while others seek to restart apoptosis, the programmed cell death that normally takes place in healthy bodies.

Genetic testing is becoming an important part of diagnosing and treating disease. More than 2,500 gene tests are available to detect the risk of ailments, and one-fifth of those are treatable. Genetic tests can for instance detect inherited DNA mutations for Huntington's disease, cystic fibrosis, breast cancer, porphyria, haemochromatosis, familial hypercholesterolemia (FH), hemophilia A and B, brittle bone disease, Duchene muscular dystrophy, albinism and spinal muscular atrophy. Other conditions associated with genetic risk factors include Alzheimer's disease, alcoholism, autism, diabetes, colon cancer, and obesity.

8. The epidemic of non-communicable diseases

Several chronic, non-communicable diseases (NCD) share common genetic and patho-physiologic risk factors. These include inflammation as a common underlying mechanism for diabetes, atherosclerosis, osteo-arthritis, autoimmune diseases, depression, and cancer. Characterizing an individual inflammatory phenotype may be a potent health predictor. Biomarkers for inflammation have been added to the routine diagnostic armamentarium of the physician. Inflammatory responses to stress can be modified by behavior.

The shift in prevalence from acute to chronic disease and a growing recognition of the inherent limitations and consequences of grounding medical care primarily around an acute-care model are among the most powerful forces that will influence change. Resistance to

change and eagerness for it exist simultaneously within all established systems; both perspectives represent important issues that must be addressed successfully to ensure that changes are purposeful, practical, and effective [1].

9. 21st Century chronic care model; prospective health care

The transformation of 21st century medicine from the prevailing acute-care model to a more effective chronic-disease model will succeed only if we attack the underlying drivers of the epidemic—the complex, lifelong interactions among lifestyle, environment, and genetics [3].

A shared understanding of the powerful, primary influence of lifestyle and environment upon genetic vulnerability in the initiation and progression of chronic disease must be matched with a therapeutic approach that reverses the path toward disease and disability, promotes health, and empowers patients as full partners in the lifelong pursuit of wellness. Chronic diseases develop as a consequence of an individual's baseline susceptibility coupled with their exposure to environmental factors. These may trigger initiating events, leading to the accumulation of pathological changes and the onset and progression of chronic disease.

Today, most health-care expenditure is focused on organ pathology causing recognizable disease states, long after the development of many underlying dysfunctional and pathological changes. Until recently, it could be argued that the focus on treating disease was justified because the ability to predict, track, and prevent its onset was not technically feasible. This is no longer the case as the emerging sciences of genomics, proteomics, metabolomics, medical technologies and informatics are revolutionizing the capability of physicians to predict events and enable intervention before damage occurs. Personalized risk prediction and strategic health-care planning will facilitate a new form of care called "prospective health care." Prospective medicine is the ability to identify those individuals most at risk for developing chronic diseases and to provide a customized means to prevent or slow that progression are emerging competencies and provide the foundation for prospective care.

A very compelling element of prospective medicine is the call for fundamental change in clinical practice—from treating people only when they are sick enough to visit the doctor's office to prospectively examining individual risks and developing comprehensive preventive strategies based on the best available evidence at the time. This would, indeed, revolutionize medicine; not only would it shift the emphasis on primary care rather than focusing on expensive hospital-based tertiary care, but it would establish a serious partnership between patient and clinician aimed at lifelong health.

10. Conclusion

Integrative medicine integrates the therapeutic relationship between doctor and patient, lifestyle medicine including the effective use of exercise, diet, stress management and spiritual wellness as therapeutic tools. Traditional healers, certain complementary and alternative practices with proven efficacy, does have a role to play, and last but not least; conventional (allopathic) medicine will always play a central role in the healthcare model. Integrative medicine can contribute to sustainable healthcare systems in the world including its role in health maintenance, health education, self responsibility for health, motivation for healthy lifestyle change and less invasive and more cost-effective treatment of illness. This will ultimately lead to active and healthy ageing.

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