

The Advent of Lifestyle Medicine

Byung-Il Yeh¹ and In Deok Kong^{2,*}

¹Wellcome Unit for the History of Medicine, Oxford University, Oxford, United Kingdom, ²Department of Physiology and Center for Exercise Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea

The fact that lifestyle is closely associated with the pathogenesis of chronic diseases has been known for more than three decades. Smoking may cause lung cancer, and a lifestyle of fast food consumption and little exercise can cause metabolic diseases. The importance of lifestyle changes in terms of a new medical paradigm to solve chronic diseases is becoming popular in modern times. Lifestyle medicine is a medicine based on personal lifestyle. To apply it to patients and ordinary people, physicians have to cooperate with experts in many fields such as nutrition, exercise, psychology, etc. In addition, patients must be partners in the treatment rather than passive recipients. The advent of lifestyle medicine has been caused by changes in disease patterns. In the past, acute diseases like infectious disease were prevalent; however, in the late 20th century, chronic diseases such as metabolic diseases, cancers, neurological disease, etc. increased in occurrence. As lifestyle is closely related with these diseases, the attitudes toward medicine need to be changed. Recently, the concept of “Lifestyle Medicine” was proposed, and we predict it will be an important field in future medicine.

Key Words: A new medical paradigm, Chronic disease, Lifestyle, Lifestyle medicine

INTRODUCTION

Mankind has historically suffered from a scarcity of food. The traditional Korean word “Borigogae” (pass of barley) refers to such a situation, that is, the scarcity of food during the spring when they depended on rice until barley was ready for harvest. The reason many people today have health problems such as obesity, diabetes, metabolic syndrome, hypertension, etc. is related to this historical background. Through the evolutionary history of limited food conditions, the bodies of our ancestors adapted to accommodate for this scarcity. Thus, the human body’s storage capacity developed to conserve energy sources [1].

However, as Golub asserted in <Limits of Medicine>, many things have changed in the last century [2]. As acute diseases by microbiological infection is no more important problem, diseases pattern was changed. Instead, chronic diseases became an important topic. The insistence that insufficient food supply would cause a population reduction in undesirable situations like war, as described in <An Essay on the Principle of Population> by Thomas Robert Malthus [3], was proved wrong. Since the end of World War II, the food supply have become more and more abundant, and the population has increased. In advanced countries, people walk less because they use their own cars and work in their offices instead of running around to catch up with wild animals to provide proteins for their bodies.

In modern times, a new paradigm is needed to address modern health problems because chronic diseases are becoming more and more common, replacing acute diseases like infectious disease. The characteristics of these increasing chronic diseases are associated with the lifestyles of

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*Corresponding author: In Deok Kong

Department of Physiology and Center for Exercise Medicine, Yonsei University Wonju College of Medicine, 20 Ilsan-ro, Wonju, Gangwon-do 220-701, Republic of Korea
Tel: 82-33-741-0292, Fax: 82-33-745-6461
E-mail: kong@yonsei.ac.kr

people. This association resulted in the birth of the term “Lifestyle Medicine.”

In this review, we analyze the history and backgrounds of the birth of lifestyle medicine and discuss its current state. Lifestyle medicine will become more important in the future, and the clarification of the purposes of lifestyle medicine will assist in the revision of modern medicine.

THE DEFINITION OF LIFESTYLE MEDICINE

The term “lifestyle medicine” was first used in as a title of a symposium in 1989 [4]; it first appeared in publication as a title of an article in 1990 [5]. In 1999, Rippe stated that “lifestyle medicine involves the integration of lifestyle practices into the modern practice of medicine both to lower the risk factors for chronic disease and/or, if disease is already present, serve as an adjunct in its therapy. Lifestyle medicine brings together sound, scientific evidence in diverse health-related fields to assist the clinician in the process of not only treating disease, but also promoting good health.” His book entitled <Lifestyle Medicine> is considered to be the first textbook and landmark publication of lifestyle medicine [6].

In another textbook also titled <Lifestyle Medicine>, lifestyle medicine was defined as “the application of environmental, behavioural, medical, and motivational principles to the management of lifestyle-related health problems in a clinical setting” [7]; the second edition of this book issued four years later added “inducing self-care and self-management to reflect the recent emphasis on self-management as essential for the proper treatment of chronic disease.” The second edition also included four additional chapters, and the subtitle “managing disease of lifestyle in the 21st century” was added.

The American College of Lifestyle Medicine defines Lifestyle Medicine as “the use of lifestyle interventions in the treatment and management of disease.” It continues that “Such interventions include diet (nutrition), exercise, stress management, smoking cessation, and a variety of other non-drug modalities” [8]. The European College of Preventive and Lifestyle Medicine (ECLM) defines lifestyle medicine as “the research and clinical prevention and treatment

of dysfunctions caused by a non-physiological lifestyle accumulating allostatic load (lifestyle-related diseases, LRDs)” and/or “prevention and treatment of LRDs through nutritional, exercise, psychological, social, environmental and pharmaceutical interventions” [9].

Thus, lifestyle medicine is defined in many ways and has changed with time. The common point of these definitions of lifestyle medicine is the focus on lifestyle and its important role in treatment and rehabilitation of disease as well as prevention.

WHY IS LIFESTYLE MEDICINE NEEDED FOR HEALTH?

About 2,500 years ago, the Greek physician Hippocrates stated, “in order to keep well, one should simply avoid too much food, too little toil” [10]. Both Chinese and Greek philosophers have said “Use moderation” and “All things in moderation.” These attitudes are also important to maintain individual health.

The current health problems in developed countries are related to excess energy supplies and are due to such factors as fast food and limited physical activity arising from automation, commuting by car, generalization of office work, and the increase in stationary indoor activities like watching television. Due to these changes of lifestyle, diverse diseases like cardiovascular and metabolic diseases are more and more common.

Hence, the authors of <Lifestyle Medicine: Managing disease of lifestyle in the 21st century> insisted “The Hippocratic prescription now needs to be expanded.” This can be interpreted in a more modern tone to say ‘don’t smoke, don’t eat too much fat (or eat or drink too much in general), don’t drink too much (or too little) alcohol, try not to get anxious or depressed, balance your stress, don’t do too many drugs (of any kind), don’t have unsafe sex, eat breakfast, perform regular physical activity, sleep well and for long enough, do some stretching and strength work every other day, wear sunscreen, use a moisturizer, avoid air conditioning where possible, keep the skin well hydrated, chew gum, floss regularly, and remember, moderation in all things-including moderation’ [11].

The lives of contemporary man vary from person to per-

son, although lifestyle choices are closely related to health state in nearly all people. This is the reason we consider lifestyle an important indication of health. In the preface of <Lifestyle Medicine>, Rippe expressed his hope that lifestyle medicine “will open an entire new branch of medicine emphasizing the important linkages between clinical practice and the recommendation of positive lifestyle behaviours for patients.” We agree with this opinion and are confident that lifestyle medicine will become an essential core issue in modern medicine.

CURRENT STATE OF LIFESTYLE MEDICINE

Can lifestyle medicine be considered one of the interdependent fields in medicine? Our answer is “Yes.”

The concept of lifestyle medicine was first used 24 years ago, and 14 years have passed since the landmark textbook <Lifestyle Medicine> was published by Rippe. However, the popularity of lifestyle medicine within modern medicine remains weak, as only two journals entitled <American Journal of Lifestyle Medicine> and <Journal of Lifestyle Medicine> have been being published in the field, in America and Republic of Korea, respectively. These two journals are issued not by a national society of lifestyle medicine, but by the Lifestyle Medicine Association and the (small) Institute of Lifestyle Medicine, respectively.

The American College of Lifestyle Medicine (ACLM) is “the first national professional society for clinicians specializing in the use of lifestyle interventions in the treatment and management of disease” [8]. The ACLM has conducted many events such as annual meetings (since 2011), letter publications (since 2008), education programs and so on. However, the role of the European College of Preventive and Lifestyle Medicine (ECLM) and the Australian Lifestyle Medicine Association (ALMA) has to increase for lifestyle medicine to be independent. Though the ALMA twice published the textbook <Lifestyle Medicine>, it does not publish its own journal, as is the case with the ECLM.

In South Korea, lifestyle medicine is also gaining popularity. In several medical institutions, for example, Yonsei, Inje, Chonbuk, and Inha, the scholars interested in this field formed a group for research and study. Members of the

Lifestyle Research Group at Chonbuk National University Medical School collaborated to translate the second edition of <Lifestyle Medicine: Managing Diseases of Lifestyle in the 21st Century> into Korean, and many scholars in a variety of schools are becoming more interested in lifestyle medicine.

The influences of these groups has not yet extended across the whole country, but many scholars in many fields like nutrition, exercise, medicine, and psychology are becoming more interested and realize the necessity to gather their abilities to solve common medical problems in modern society.

THE CHARACTERISTICS OF LIFESTYLE MEDICINE

We introduced lifestyle medicine as a new concept for modern medicine; however, this concept is not a new one. When the first article which showed lung cancer was due to cigarette smoking was published [12], many people were surprised. However, 35 years has passed since this realization, and it is now common knowledge that smoking is one of the most significant risk factors for many kinds of cancer. As we described in the section “Why Is Lifestyle Medicine Needed for Health?,” smoking is regarded as a lifestyle practice, and the word “lifestyle” has been used for many years. Because of this familiarity, many people believe that lifestyle medicine is not new.

For about 50 years, the importance of lifestyle such as exercise, smoking, diet, alcohol, psychological state, etc. has been well known. Most people accept that daily lifestyle plays a key role in personal health and improves quality of life. The important demand for “Lifestyle Medicine” is intervention of clinicians.

Lifestyle has become more and more important in regard to personal health, resulting in many changes in daily life.

1. Exercise medicine for general people became more important than sports medicine for sports player.
2. Physicians know the importance of diet, but this is something they cannot prescribe. Instead, they send their patients to consult with nutritionists.
3. Regardless of personal enjoyment, smoking is becoming more difficult due to restrictions under the control of

rules, even laws.

4. Fitness and wellness centers have become popular for those interested in their health and understanding the necessity of physical activity (though many people continue to rely on cars for commuting).
5. More than 50 years ago, no physicians were interested in patients' daily lifestyles; however, physicians now emphasize the importance of lifestyle as well as medication.

The last change may be the most important for widespread acceptance of lifestyle medicine. Physicians began to see lifestyle as a critical tool for care of patients as well as ordinary people. A healthy lifestyle began to be advocated to prevent diseases and maintain health in healthy individuals and for treatment and rehabilitation of patients. Egger et al. concluded that "Lifestyle medicine forms a bridge with public health and health promotion, where the latter is defined as 'the combination of educational and environmental supports for actions and conditions of living conducive to health'" [10]. (The contents in single quotation mark is taken from Greene and Kreuter's material [13]).

In the past, patients wanting to return to good health had to obey physician's order. In modern times when chronic diseases are common, such an attitude is not as useful for health. Patients now have to be partners in their own health rather than just accepting prescribed treatments. To solve medical problem, patient self-management is more crucial than any other factor [14].

The differences between traditional/conventional and lifestyle medicine are shown in Table 1, which is taken from <Lifestyle Medicine: Managing disease of lifestyle in the 21st century> [15].

Lifestyle medicine is not applicable to all diseases; it focuses on an individual person and/or a small group and involves research to find the best methods to prevent, treat, and rehabilitate patients through adherence to desirable lifestyles. To this end, it is core of lifestyle medicine for clinicians to engage actively and for people to participate as partners.

LIFESTYLE AND PIMA INDIANS

The Pima Indians live in Arizona, USA and Mexico. In 1979, a report showed that the prevalence of diabetes in the Pima Indians of Arizona was higher than those in any other population. For example, it was 19-fold greater than that in Rochester, Minnesota, USA [16] based on large cohort studies. The reasons for this were of interest to the medical community.

The first possibility is that the Pima developed an increased ability to store energy. Like other Indian tribes, their ancestors came from the Eurasian continent, setting foot on the American continent about 30,000 years ago. Since that time, due to the need to overcome very harsh environmental conditions, it is possible that this population could have evolved such a genetically profitable trait.

There are some characteristics of the Pima Indians that

Table 1. Differences between traditional/conventional and lifestyle medicine approaches in primary care

Traditional/Conventional medicine	Lifestyle medicine
Treats individual risk factors	Treats lifestyle causes
Patient is a passive recipient of care	Patient is an active partner in care
Patient is not required to make major changes	Patient is required to make major changes
Treatment is often short term	Treatment is always long term
Responsibility is on the clinician	Responsibility is also on the patient
Medication is often the 'end' treatment	Medication may be needed, but the emphasis is on lifestyle change
Emphasizes diagnosis and prescription	Emphasizes motivation and compliance
Goal is disease management	Goal is primary/secondary/tertiary prevention
Less consideration of environment	More consideration of environment
Side effects are balanced by benefits	Side effects that impact lifestyle require greater attention
Involves other medical specialties	Involves allied health professionals
Doctor generally operates independently, on a one-to-one basis	Doctor is part of a team of health professionals

This table is cited from <Lifestyle Medicine: Managing disease of lifestyle in the 21st century> [15].

may have contributed to the high rate of diabetes. The population has minimal European admixture [17], and type 1 diabetes is very rare even in young subjects [18]. The facts that this population has limited genetic and environmental variability and a low incidence of type 1 diabetes makes them a good population in which medical scientists can search for the genes associated with type 2 diabetes. One such study showed that the diabetes in the Pima Indians' was familial [19]. The population contains individuals who suffer from most of the clinical characteristic of diabetes such as obesity, insulin resistance, dysfunction of insulin secretion, and increased rates of endogenous glucose production [20]. As the diagnostic criteria for type 2 diabetes according to the World Health Organization were based on a Native American population [21], the findings in Pima Indians indicate that major metabolic pathways related to the pathogenesis of diabetes are common to both Native and non-Native Americans.

Until the 1940s, obesity and diabetes were very rare among Pima Indians who lived in mountainous area and retained a traditional lifestyle. In order to investigate the prevalence of diabetes and obesity in the 1960's, scientists noted the change in their lifestyle. Pima Indians were divided into those in Arizona and Mexico 700-1,000 years ago, which means these two groups were genetically linked [22]. Medical scientists compared the prevalence of Pima populations in Arizona, USA and Mexico. Inevitably, the diabetes prevalence was very low in Mexican Pima Indians, as in the Pima Indians in Arizona. Different disease patterns between the two populations resulted from environmental influences on lifestyle, especially food intake [23]. Pima Indians currently living in Arizona follow the Western lifestyle, including ingestion of fast food, which contributes to diabetes and obesity. Similar changes have been observed in Mexican Pima Indians. When a cohort study was performed in 1995, the Mexican Pima Indians were practicing traditional methods of farming, involving long walks to remote farm and many hours of daily work. However, the same research team found that the prevalence of obesity and diabetes had increased after 15 years due to increased availability of electricity and grocery stores. Thus, the lifestyle of Mexican Pima Indians began to look like that in the Arizona population, resulting in an increase in the prevalence

of obesity and diabetes in Mexican Pima Indians [24].

Meanwhile, many researchers tried to identify the genetic factors which resulted in type 2 diabetes of Pima Indians. Hanson et al. published an article which showed chromosome 11q23-q24 region might influence type 2 diabetes [25], but another group of researchers reported that "Identifying a single functional variant within a gene is not always equivalent to identifying the causative variant/variants. A difference that is measured in vitro may be insufficient to cause, or even be unrelated to, the in vivo physiologic perturbations that lead to type 2 diabetes" [26].

Developments in genetics led to the discovery of candidate genes for specific diseases like Huntington's chorea and/or phenylketonuria. When the candidate genes for obesity, dementia, height, IQ, were discovered, it was believed that many diseases and signs could be explained by one's genetic background. However, to explain diseases and body conditions using only genetics has proved impossible. The candidate genes for type 2 diabetes have been reported by many researches, but many loci vary among races and ethnic groups [27-29].

The fact that candidate genes for the same disease are different according to race or ethnic group shows that lifestyle must be considered as an important factor in lifestyle medicine.

THE DEVELOPMENT OF LIFESTYLE MEDICINE DURING THE PREVIOUS DECADE

The term "lifestyle medicine" has become more prevalent since its first use in 1989 [4]. For many medical scientists, it is no longer new to regard lifestyle as an important factor in human medicine. Articles discussing lifestyle medicine have been increasingly published. Here we introduce several review articles issued in the previous decade.

The insistence that lifestyle can improve health and be helpful to treat diseases has been posited by many authors [30-34]. Some articles targeted specific groups on the basis of age [35,36]. In addition, a review of a military population, which can be regarded as a closed society, was reported [37]. This showed the influences and effectiveness of lifestyle medicine in many different populations.

Lifestyle medicine is actively developing in America, Australia, and several European countries and is starting to grow in some Asian countries like Japan [38,39], Taiwan [33], and India [40]. Articles devoted to lifestyle medicine have been increasing, indicating that lifestyle medicine is becoming popular around the world.

Recently, review articles aimed at special disease groups have also been introduced, particularly for cardiovascular diseases [31,32,41,42]. One such study showed how to reduce high blood pressure through lifestyle control [42]. In the preface of <Lifestyle Medicine> involving “Lifestyle management and prevention of cardiovascular disease”, Rippe wrote “risk factor management in the clinical management of cardiovascular disease has taken a prominent position amongst lifestyle interventions in American medicine,” indicating that cardiovascular diseases are the most useful field using lifestyle medicine.

The three editors of <Lifestyle Medicine> published in Australia in 2007 proposed that lifestyle medicine would be used to manage chronic diseases. The authors described lifestyle as an etiology of chronic disease and emphasized its significance for primary care consultations. They insisted “A modified clinical approach, based around the concept of lifestyle medicine, helps fill the gap by adding behavioural, motivational and environmental skills to conventional medical practices” [43]. The suggestion that the clinician role has to be extended for expanding lifestyle medicine was proposed not only in this review, but also in another one in 2004 [30].

USE OF LIFESTYLE MEDICINE TO SOLVE MEDICAL PROBLEMS

Chronic diseases are the leading causes of mortality around the world [44]. This indicates that lifestyle factors such as nutrition, smoking, alcohol consumption, stress, and physical inactivity have a major role in the pathogenesis of these diseases [45-47]. In general, metabolic diseases are closely related to lifestyle, and chronic diseases including cardiovascular disease, metabolic syndrome, obesity, type 2 diabetes, and some kinds of cancer are known as lifestyle-related diseases (LRDs).

Lifestyle medicine appeared with the expectation of aiding in the prevention, treatment, and rehabilitation of LRDs as well as improving public health. Lifestyle is practiced outside of the medical clinic, so lifestyle intervention has to be administered on an outpatient basis. To accomplish the aim of lifestyle medicine, a clinician has to cooperate with experts in other fields. For this, clinicians have to intervene in people’s lifestyle. As lifestyle medicine has emerged as a major issue, its relation to medication has changed. Physicians generally prescribe medication at a known fixed dosed. However, tailored reduced amounts must be considered when lifestyle is taken into consideration.

The Medical Board of California has begun to guide the process and content of lifestyle medicine training for chronic diseases [48]. This is one example illustrating the increasing popularity of lifestyle medicine. To solve medical problems by control of lifestyle, continuous education and information is required.

The main problem in convincing people of the importance of lifestyle medicine is the difficulty of motivating patients to change their lifestyles. A previous study showed that follow-up with a health educator as well as physician-structured counseling increased the amount of weekly walking exercises compared with the control group receiving only standard care [49]. Another study showed that only 11% of patients with diabetes follow their instructed diet [50]. To overcome this resistance to lifestyle change, clinicians need to be more active in the encouragement of patients. According to one previous study, in addition to the need to cultivate confidence and knowledge about lifestyle control programs, a lifestyle medicine education program is also required.

In conclusion, the important thing for wellness in modern times is to change undesirable behavior and maintain a healthy lifestyle. A healthy lifestyle is the foundation of prevention, treatment, and rehabilitation of diseases, in addition to health promotion. To encourage patients and ordinary people to live healthy lifestyles, physicians armed with sufficient knowledge must participate with confidence and in accompaniment with a healthcare team. Therefore, medical policy and community programs are also needed to support the spread of lifestyle medicine.

CONCLUSION

Lifestyle has changed as time passes. Such changes of lifestyle are closely related with the changes of disease pattern. To solve the health problems today and future medical doctors as well as ordinary people need to be interested in lifestyle. The important role of physicians has been to diagnose and treat diseases so far, but in the future they will have to solve them focusing the lifestyles. Therefore, lifestyle medicine will be an important field in future medicine.

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