Potential Benefits of Falun Gong Practice in COVID-19 Pandemic

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Abstract

Objective: The COVID-19 pandemic is the largest public health crisis of this century. Challenges include the overactive immune responses such as cytokine storm and hyper-inflammation, increased likelihood of severe complications in high-risk populations, limited treatment options mainly based on supportive care and potential long-term complications from clinical management. Falun Gong was the most popular qigong in China before 1999. Limited studies have demonstrated significant positive effects of Falun Gong practice on Health Related Quality Of Life (HRQOL), cellular function and gene expression. A health survey using SF36 in Taiwan revealed significantly higher HRQOL and abstinence of unhealthy behavior including smoking among Falun Gong followers. The health benefits were also observed in those 60 years and older, and those with previous chronic conditions, all of which are among the high-risk populations in COVID-19 for severe complications. Gene expression and cellular study results of Falun Gong practice were characterized by enhanced immunity, down regulation of cellular metabolism, and alteration of apoptotic genes in favor of a rapid resolution of inflammation. Biophysical and bio-energy study demonstrated enhanced energy field and cellular function. We hypothesized that the practice could play a potentially significant role in supporting the prevention, treatment and reducing long-term complications of COVID-19.

Methods and Results: By searching the internet using diagnosis as keywords, including “SARS”, “Novel Coronavirus Pneumonia”, “Pulmonary Fibrosis”, and “Femoral Head Necrosis”, we found different number of cases in which patients recovered by learning and practicing Falun Gong.

Conclusion: These results suggest potential benefits of Falun Gong practice in the prevention, treatment and prognosis in COVID-19 and warrant further studies.

Keywords: Falun Gong • COVID-19 • High-Risk Population • Treatment • Cytokine Storm • Immune Response • Energy Field • Health Related Quality Of Life

Introduction

SARS-CoV-2 and the COVID-19 Pandemic

Coronavirus disease 2019 (COVID-19) is caused by infection of SARS-CoV-2, a member of the beta coronavirus family. SARS-CoV-2 is a 30 kb enveloped, positive sense, single-stranded RNA virus. The virus consists of four structural proteins (spike surface glycoprotein, envelope protein, membrane protein, and nucleocapsid protein) and non-structural proteins. The spike protein consists of two functional subunits. The S1 subunit is responsible for binding to the host cell receptor and the S2 subunit is utilized for the fusion of the viral and cellular membranes [1,2]. Studies showed that the spike protein for SARS-CoV-2 binds to Angiotensin Converting Enzyme 2 (ACE2), which is also a functional receptor for SARS-CoV. ACE2 expression is high in lung, heart, ileum, kidney and bladder. Thus, SARS-CoV-2 virus primarily affects the respiratory system, although other organ systems are also frequently involved [1]. Our understanding of the viral biological behavior and pathophysiology is still evolving. Approximately 1% of infected people develop severe Acute Respiratory Distress Syndrome (ARDS) that requires critical care. Other serious complications include lymphocytic myocarditis, disseminated intravascular coagulation, and lymphocytic infiltration [1-3]. ARDS, multiorgan failure and septic shock are the main causes of death for people infected and are more likely to occur in those over the age of 60, in smokers, and in people with previous medical conditions such as diabetes, Chronic Obstructive Pulmonary Disease (COPD), Cardiovascular Diseases (CVDs), hepatitis, hypertension, or pregnancy [2].

The immune system has important roles in SARS-CoV-2 disease course. At the early stage of infection, the immune cells eliminate the virus by producing primary cytokines, which may be beneficial for eliminating the virus but results in inflammation. When disease progresses into more severe stages in COVID-19 patients, many cytokines are released, such as IL-6, IL-1, IL-2, IL-10, and TNF-α in the whole body of the patient. These cytokines could cause a cytokine storm and hyper-inflammation which can result in multi-organ failure occurs in more severe cases of SARS-CoV-2. For example, cytokine storm in the pulmonary tissue frequently leads to acute respiratory distress syndrome (ARDS). Increased neutrophil-to-lymphocyte ratio as well as CD4+ T lymphopenia, and lymphopenia are reported in the majority of COVID-19 cases with severe phenotype [2,3]. While long term complications of COVID-19 is not yet fully understood, the presumed sequelae of the disease would likely resemble those of the Severe Acute Respiratory Syndrome (SARS). SARS patients are known to suffer reduced pulmonary function, exercise capacity, chronic fatigue, impaired health status, and more severe complications such as pulmonary fibrosis and femoral head fibrosis [4,5].

Most treatment for SARS-CoV-2 has been based on supportive care.
Drugs used, suggested and trialled include remdesivir, lop inavir/ritonavir, hydroxychloroquine, convalescent plasma, synthetic antibodies, interferon’s, low dose steroids, azithromycin, IL-6, IL-1 inhibitors, anti-TNF, and various other support treatments according to the clinical complications of the patients. To deal with the over-reactive immune response and cytokine storm, the FDA has allowed the use of a device by CytoSorb® that filters cytokines from the blood of patients and improves the immune response. Clinicians and researchers are also looking for other options to target the replication or clinical manifestations of SARS-CoV-2 Vaccine are promising yet with concerns such as safety and Antibody-Dependent Enhancement (ADE).

Falun Gong

Recent decades have witnessed that health care is evolving into a patient-centered, outcome-based, integrated care model. There is an increasing demand among various (integrated) healthcare models to include disease prevention and wellness programs [6]. An important component of preventive and wellness programs is to integrate effective Complementary And Alternative Medicine (CAM) such as diet, nutrition, exercise and patient self-management of health to improve wellbeing [7]. CAM has been used in the integrative treatment and management of COVID-19 in the mild, moderate and severe cases [8]. The health benefits of yoga, Tai Chi and qigong have been evaluated previously, yet among available Complementary, Traditional and Integrative approaches, the benefits of Falun Gong (FLG) have been under-reported in the scientific literature.

Falun Gong (FLG, also known as Falun Dafa; "Falun" in Chinese meaning “The Law Wheel”, a term from the Buddha’s school), was introduced to the public in China in 1992 by Mr. Li Hongzhi and has since spread to other countries around the globe, including Taiwan and the United States [9]. During 1992-1994, Mr. Li hosted classes throughout China, most in the format of 9-day lectures or seminars. During the classes, students would have their body “purified” and had health status significantly improved. Those who did not attend Mr. Li’s classes, the most majority of Falun Gong followers (practitioners), can learn Falun Gong either by self-teaching through downloading free lectures and watching/listening audio-video material from internet; or they can join local groups and learn from experienced followers, again free of charge.

The Falun Gong exercise set includes four slow-motion movements and a tranquillity meditation, able to be completed without the need for mind guidance or complex breathing techniques (Figure 1). The formality of the Falun Gong exercise may look somewhat similar to some types of qi gong, yoga or Tai Chi, but importantly the key difference is Falun Gong’s emphasis on the improvement of moral and spiritual characters by following the three core principles of “Truthfulness, Compassion, and Forbearance”, which are explained in the main book Zhuan Falun [10]. Applying these three core principles in daily life typically leads to not only moral and spiritual improvement, but also health promoting behavioral changes, including abstaining from alcohol consumption and quitting smoking. Those who practice Falun Gong (FLG practitioners or followers) are encouraged to do group exercise, read Zhuan Falun together, and share experiences to inspire and support each other. These differences make Falun Gong unique amongst other CAM approaches. Therefore, knowledge toward yoga, Tai Chi and qigong is not necessarily applicable to Falun Gong.

In current study, we hypothesized that Falun Gong practice could support the prevention, especially for the high risk population, the treatment and the reduction of potential long-term sequelae of SARS-CoV-2 infection.

Materials and Methods

Study design

Retrospective internet search for cases of interest.

Ethics statement

The data source is de-identified clinical information from the internet. Use of de-identified data would not constitute human subjects research.

Falun Gong website search

A major website run by Falun Gong followers is the Minghui (clearwisdom) website (https://en.minghui.org/). Mr. Li’s teaching materials can be found at this website as well as the Falundafa.org. However, Minghui also publishes sharing articles by Falun Gong followers. Case search was performed, using diagnosis as searching keyword, from Falun Gong website (Chinese), with time range from July 1999 to present.

Results

The web search for diagnosis of “SARS”, “novel coronavirus pneumonia”, “pulmonary fibrosis” and “femoral head necrosis” yielded different numbers of cases, as summarized in Table 1. Below were representative cases.

The search for “novel coronavirus pneumonia” yielded 2 cases within one family. Author B’s sister was working in a hospital in Wuhan [11]. On January 29, 2020, she called B because she had worsening clinical symptoms gotten sicker. The CT result suggested severe pulmonary COVID-19 infection. Showed that she was infected and it was serious. A asked her to stay together and listened to Mr. Li’s lectures. She had another CT exam during the first week of February, which showed that her sickness was under control and she was getting better. Her husband who manifested COVID infection symptoms such as poor oral intake and fever also visited came to stay with B. At first, they couldn’t eat or drink and he had a fever. After listening to Mr. Li’s lectures for a few days, he was able to eat and his fever was gone. He has also fully recovered.

The search for “femoral head necrosis” yielded 82 cases. Among them was patient C who was a physician [12]. “When C first finished listening to Mr. Li’s nine-day lectures, C found that her legs were now able to bear the full weight of his body while standing. An X-ray of her hip taken three months later showed that the previously deformed, nodular-looking ball of the hip joint now had a fine layer of new bone growth around it. One year later, her symptoms of hip degeneration were gone, and in a second X-ray of hip joint, the reading was fairly close to normal that the ball of the hip had undergone more bone growth and maturation, and was now round like a normal person’s.” In other words, his hip bones, which had once been “as soft as bean curd” (as described by an orthopedic surgeon who had operated on his hip), had regenerated.

C also shared her experiences with pulmonary fibrosis “I developed interstitial lung fibrosis (commonly known as hardening of the lungs) in June 1999. I sought treatment at the local major hospital and was later transferred to the Beijing Union Medical College Hospital’s respiratory unit. After more than a month of tests and treatment, my condition didn’t improve and instead got worse by the day. My breathing function was getting poorer, and I lost weight. I was constantly breathless and had to be on oxygen 24 hours a day. Lung scans showed that my lungs had shrunk to 60% of their normal size, and by the time they were 40% their normal size, my lungs were just solid patches with no visible air spaces on the scans. Despite being treated at the renowned Medical Union College for over a month, my condition had gotten worse. My primary
In 1998, there were self-organized health surveys of FLG followers from around the Chinese government during 1992-1999, was considered to be partially exponential to 70 million from mid-1992 to 1999, as well as its support from vast majority of Falun Gong followers did not attend Mr. Li’s classes; instead, as the top among nearly 2,400 qigong schools in China at the time [13,14]. The estimated number of Falun Gong participants in China increased exponentially to almost 70 million from mid-1992 to 1999, ranking Falun Gong as the top among nearly 2,400 qigong schools in China at the time [13,14]. The vast majority of Falun Gong followers did not attend Mr. Li’s classes; instead they learned by either joining local groups, doing book reading and exercise with the group, or self-learned by reading Mr. Li’s books, especially the main book “Zhuan Falun” and watching the audio-video teaching materials. Mr. Li emphasizes the importance of book reading or listening to his audio- or watching his video-teaching tapes and the effects of these self-learning would be the same as attending his classes. FLG followers are required to study these teaching materials (book, audio-video materials) repeatedly. The effects of these learning in the health-related quality of life and perceived health of these teaching materials (book, audio-video materials) repeatedly. The effects of these self-learning would be the same as attending his classes. FLG followers are required to study these teaching materials (book, audio-video materials) repeatedly. The effects of these learning in the health-related quality of life and perceived health of

### Discussion

Detailed discussion of the complications and treatment of COVID-19 is beyond the scope of this manuscript. Current study provided cases of healing of SARS, COVID-19 by listening to Falun Gong teaching lectures and healing of pulmonary fibrosis and femoral head necrosis, which was long-term complications of SARS either due to infection or steroid use during medical care, and could be potential complications of COVID-19 as well. These cases of healing supported our hypothesis. Other previous studies of Falun Gong, while limited in number, also provided some evidence to support our hypothesis that practicing Falun Gong might provide potential benefits to help the prevention, optimize treatment and reduce potential long-term complications of COVID-19.

### Falun Gong Learning and Practicing

Cases cited demonstrated typical experience of FLG followers when they started the Falun Gong practice. The improvement of health status and healing of disease usually takes place immediately during the 9-day lectures or soon after learning. After class or learning, Falun Gong followers are required to apply the three core principles of “Truthfulness, Compassion, and Forbearance” into their daily life and practice the exercise to maintain their health. The improvement of health status and healing of disease usually takes place immediately during the 9-day lectures or soon after learning. After class or learning, Falun Gong followers are required to apply the three core principles of “Truthfulness, Compassion, and Forbearance” into their daily life and practice the exercise to maintain their health.

### Evidence of Falun Gong’s health benefits

#### Community or population level:
The fast growth of Falun Gong, exponentially to 70 million from mid-1992 to 1999, as well as its support from the Chinese government during 1992-1999, was considered to be partially due to the widespread belief that practicing Falun Gong would improve health and reduce medical costs. To collaborate with the national review of qigong in 1998, there were self-organized health surveys of FLG followers from around a dozen of cities in China [15]. It was reported that, "Falun Gong and other types of qigong can save each person 1,000 yuan in annual medical fees. If 100 million people are practicing it, that’s 100 billion Yuan saved per year in medical fees;” says one official who is involved in the nationwide reviewing process (for qigong)." In 2003, a health survey was conducted in Taiwan using SF36 as main instrument (the 2003 Taiwan survey) [16]. It explored the perceived health status, healthcare resource utilization and related factors among Taiwanese FLG followers, compared to themselves before practicing FLG and also to the general Taiwanese norm, as reported by the 2001 National Health Interview Survey (NHIS). Compared to the norm, FLG followers had significantly higher scores in six of eight SF-36 domains across sex and age; and 82.7% reported decreased outpatient visits; indicating significantly Higher Health Related Quality Of Life (HRQOL) among FLG followers compared to general public control. Hu and associates found that the SF-36 domain scores increased with an increased length of practicing Falun Gong, the number of times of reading the book Zhuan Falun had the strongest positive association with all SF-36 domains and a significant negative association with the number of outpatient visits. The association between book reading (Falun Gong learning) and HRQOL and SF36 scores in the Taiwan study is similar to the finding in current study, between the healing of SARS and COVID-19 by listening to teaching lecture tapes which is the same as book reading. Further, they proposed to combine practice length and book reading to create a practice index as potential objective measurement for future studies of Falun Gong. High-Risk Populations for COVID-19: In COVID-19, severe lung damage can cause ARDS and aseptic shock, which are the main causes of death for people infected and are more likely to occur in those over the age of 60, in smokers, and in people with previous medical conditions. The 2003 Taiwan survey addressed the high-risk population by looking into the HRQOL of older people and those who with previous medical conditions. It found that among participants aged 65 and older, all mean SF-36 domain scores, both physical and mental, were significantly higher in the surveyed FLG participants than in the general population. Among FLG participants who had any of these four chronic conditions including pulmonary disorder before practicing Falun Gong, the vast majority (70% to 89%) reported that their chronic conditions were either cured or improved after practicing Falun Gong. Approximately 80% surveyed FLG followers quit smoking which was one risk factor for COVID-19 patients to develop severe complications.

The Taiwan survey results suggested that the practice of Falun Gong improved HRQOL in the high-risk populations to severe COVID-19, thus a potential benefit on prevention and better survival of severe COVID-19. Worth of notice is the improved mental scores in SF36 among FLG practitioners aged 65 and older, since that applying hygiene and quarantine measures, especially in patients with cognitive disorders including dementia, can be challenging [17].

#### Genomic and cellular levels:
The over-reactive immune response and cytokine storms are believed to play significant roles in the pathogenesis of COVID-19, responsible for severe organ damages and death. Feng and associates studied the gene expression by microarrays and RNase Protection Assay (RPA), as well as function (phagocytosis) and survival (apoptosis) of neutrophils from FLG practitioner [18]. They demonstrated that the changes in gene expression of FLG practitioners in contrast to normal healthy controls were characterized by down regulation of cellular metabolism (ubiquitin, E2, and E3 are significantly down regulated) and alteration of apoptotic genes (Bcl-2; Bcl-xl.; and FKBP 38) in favor of a rapid resolution

#### Table 1. Search results of healed cases by diagnosis.

<table>
<thead>
<tr>
<th>Diagnosis (Key Words)</th>
<th>Number</th>
<th>Case Description</th>
<th>Confirmed By Physician</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARS</td>
<td>1</td>
<td>Author A’s son with fever, Listening to Falun Gong lectures, temperature returned to normal the next day.</td>
<td>1</td>
</tr>
<tr>
<td>Novel coronavirus pneumonia</td>
<td>2</td>
<td>Author B’s sister working in a hospital in Wuhan. She and her husband got COVID-19. She had CT findings. Recovered by listening to Falun Gong lectures.</td>
<td>1</td>
</tr>
<tr>
<td>Pulmonary fibrosis</td>
<td>10</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Femoral head necrosis</td>
<td>82</td>
<td>Patient C, see text</td>
<td>12</td>
</tr>
</tbody>
</table>
of inflammation. The lifespan of normal neutrophils was prolonged, while the inflammatory neutrophils displayed accelerated cell death in FLG practitioners as determined by enzyme-linked immunosorbent assay. Correlating with enhanced immunity reflected by microarray data, neutrophil phagocytosis was significantly increased in FLG practitioners. They suggested that FLG practice may regulate immunity, metabolic rate, and cell death, possibly at the transcriptional level. Feng's study suggested a potentially optimized immune response to pathogens.

Feng's results also suggested increased antimicrobial function from the FLG practice. Antimicrobial peptides (AMPs) are a prevalent group of molecules in the host defense system. Besides their microbialic effects; AMPs have important functions in the regulation of repair and inflammation. AMPs are also known for their ability to recruit, modulate and activate components of the immune system [18]. Defensin 3, a cationic peptide involved in nonoxidative antimicrobial mechanisms, was increased in all of the FLG practitioners examined [18]. The reduced metabolic rate in FLG followers might help reduce the oxygen need, which is important for the treatment course of COVID-19 patients.

Effects on long-term complications: Although at this moment, the focus of the world during this COVID-19 pandemic is the prevention and the treatment of new cases and critically ill patients. However, COVID-19 patients lead to pulmonary fibrosis, such a serious threat to the prognosis of complicated [20]. The steroid use in COVID-19 treatments is frequently associated with femoral head necrosis as a long-term complication [21]. Current study provided the cases of healing of pulmonary fibrosis and femoral head necrosis by practicing Falun Gong. While pulmonary fibrosis starts to emerge as a complication of COVID-19, these cases provide preliminary evidence of reduction and healing of potential long-term complications of COVID-19.

From the energy perspective

Physical means have been used in modern medicine, such as imaging diagnostics and radiation oncology. “Qi” in Traditional Chinese Medicine can be interpreted as a form of energy or a functional status, as exemplified by that the bad Qi could imply pathogen and good Qi imply immunity. In Falun Gong, Mr. Li emphasizes a higher energy form of “Gong”. He mentioned that “A qigong master has gong..., The material elements in gong can be detected by many present-day apparatus. … Modern apparatus can detect infrared rays, ultraviolet rays, ultrasonic waves, infrasonic waves, electricity, magnetic force, gamma rays, atoms, and neutrons. A qigong master possesses all of these substances, and there are some other substances emitted by qigong masters that are undetectable because no such apparatus exists.” Mr. Li also mentioned the energy field from practicing Falun Gong. Figure 1 demonstrated a visible energy “wheel” between the arms of FLG practitioners in exercise. Liu demonstrated that this meditation energy could enhance cardiac cell contraction force [22]. Liu also demonstrated through bio-energy photography of fingers that practicing and exercising Falun Gong could intensify FLG practitioner’s energy field and improve energy circulation in the human body [23].

Conclusion

Energy related mechanisms may provide another angle to understanding and investigating Falun Gong’s effects on health, especially the fast improvement even during the learning stage given the principles of Falun Gong and the positive energy that are associated with the application of those principles in practitioners daily lives.

Acknowledgments


Competing Interests

The authors have declared that no competing interests exist.

References