The Effect of External Qi of Qigong on Biomolecule Conformation*(III)

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Abstract

The effect of External Qi emitted by a Chinese Qigong master on conformation of poly-D-glutamic acid sodium salt and RNA was studied in a chemistry laboratory of a U.S. university by monitoring the change of circular dichroism (CD) spectra with a 62DS spectropolarimeter. In comparison with the control group (no effect of External Qi), all six samples of poly-D-glutamic acid exposed to External Qi had some changes in CD spectra reading, 67% of them had significant change (more than 3 standard errors) and the ratio of elliptisity change $\Delta\theta$ to θ before effect by Qigong ($\Delta\theta/\theta_{Qi\text{-}before}$) was over the range of 1-10% with the maximum change of over 10.9%. The results confirmed our previous findings in the similar studies in China that the External Qi of the Chinese Qigong might change the conformation of bio-molecules. However, the conformation of RNA in this study did not show any significant change.

Keywords: External Qi of Chinese Qigong; Biomolecule conformation; Protein; Poly-glutamic acid; Circular dichroism spectrum; Order and disorder

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1. Introduction

Qigong is a general term for a large variety of forms of traditional energy exercises, cultivation and therapies. In general, Qigong is considered as the self-training method or process through Qi and Yi (intention and consciousness) cultivation to achieve optimal health of both mind and body. With persistent Qigong practice, the practitioners are said to develop an awareness of *Qi* sensations in their bodies and use their mind or intention to guide the *Qi* to the desired place. Some skillful *Qigong* masters can reportedly direct or emit their *Qi* energy (External *Qi*) for the purpose of healing others, which is what called External Qigong therapy or "*Qi* emission".

It is well known that *Qigong* practice may produce the health benefit and strengthening spirituality (Mayer[1], 1999; Sancier[2], [3], 1996, 1999), but it is less known that external Qigong therapy can be therapeutic to relieve pains and treat disease. There have always been some debates in the scientific community on whether the so-called External Qi emitted by a well-trained Qigong practitioner can affect some other objects, living beings and organisms. The first question is whether there is something called External Qi that can be emitted by Qigong master. It seems that there are a lot of positive literature confirming this notion (references), if yes, and then the second question will be how External Qi works with organic objects or organisms. Here, word "organism" implies that the effect of External Qi can be on any living objects as well as human body. People have always been interested in the mechanism of the healing effect of External Qi. Some are skeptic on the Existence of external Qi and consider the effect of Qigong healing purely psychological. There is no doubt that psychological effect play an important role in the process of human defeating disease, healing and recovering, and it may be true that Qigong therapy has the elements of psychological effect. However, many experiments reported the effect of External Qigong on plant, microorganism, bacteria and cells, which cannot be completely explained by psychological factors.

From the perspective of a chemist, most of the life objects mentioned above consist of biomolecules, and the basic elements of these objects are protein, DNA or RNA etc. Therefore, if we can use some of typical biomolecule as the research subjects, which had no psychological element at all, to study the potential effect of External Qi, and to examine if the External Qi can cause the change in the biomolecule structure. This type of study may, on one hand, verify the objective existence of External Q. On the other hand, this type of study may provide some clue for us to recognize the potential mechanism of Qigong healing process, since the change in structure would eventually lead to change of function. It is our assumption that the effect of External Qi on the basic structure of biomolecule is most like on the level of conformation, while the change in the conformation of biomolecule may cause a series of change in the life object or life phenomenon. Therefore, the purpose of the current study is to explore the "objective existence of External Qi" emitted by Qigong master and "how External Qi may affect the life objects" through the experiment of emitted Qi to biomolecule materials, which can effectively exclude the potential

psychological effect in Qigong healing.

In terms of the method of our experiment, we measured the change of the bio-molecule conformation of the sample that exposed to External Qi effect with circular dichroism (CD) spectra, in comparison with the controls (non-exposure reference sample). It is widely known that the circular dichroism spectrum is one of the most sensitive, dependable and advanced devises for measuring the variation of the molecule conformation, and its measure process isn't affected by the subjective intention of the experimenter; therefore, the experiment is maneuverable and the result is objective. The similar studies in the 1990s with positive findings in China have been reported in Chinese journal [4], [5]. However, it will be more convincing if we can repeat the similar study at different condition: different laboratory with difference Qigong master and different CD spectrometer, under the direction of different investigator. This way the study may generate more reliable and significant results for us to make objective judgment on the collected data and the effect process. Therefore, the current study, as the third one of a series of reports, took place in the lab of chemistry department in a U.S. University.

2. Material and Methods of the Experiments

2.1 *Instrument and Material*

Circular Dichroism Spectrometer Model 62DS (Lakewood, NJ) was used to measure CD spectra. This instrument offers the standard error for each measure and digital number of CD spectra; therefore, it provided us with relatively reliable and accurate data in judging the magnitude of possible change in biomolecule conformation.

The biomolecule sample used in the study was poly-D-glutamic acid sodium salt shortened form poly-Glu (MW (vis) 15,000, SIGMA Chemical Co.), as well as the RNA [Poly (I). (C)] sample provided by Dr. Zheng at the laboratory, with deionized water distilled twice.

The concentration of poly-Glu aqueous solution was about $C = 1.0000\times10^{-5}$ mol/L and its pH value was adjusted from original 6.9 to 5.88 with adding 0.1M HCl. While the concentration of RNA [Poly (I). (C)] was diluted from original 12 mM/bp to 600 μM/bp.

2.2 *Experiment Condition*

The 62DS CD spectrometer was working under the following conditions: sensitivity 1 nm/cm; time constant, 2 seconds; scan times 3; constant temperature 25°C; wavelength range for poly-Glu 260-200 nm, for RNA 340-240nm.

2.3 *Experiment procedure*

The same sample of biomolecule was placed into two quartz cells with pathlength 0.2cm and 600 μl capability), and then measured with CD spectra separately as the baseline measure. Then both cells were brought to the experimental room – a conference room 50 meter away from the CD

spectrometer. One of them was randomly chosen as the control, and place on the other end of the conference table (about 5 meters from the Qigong master), while the Qigong master emitted Qi to another cell at the end of the conference table.

The method of Qi emission: most of time the Qigong master used his both hands to emit Qi from Lao-Gong point (the center of the hands) from a distance of 10 cm to the quartz cell; sometimes, he also used his eyes to emit Qi or energy by staring at the cell. During the experiment the Qigong master never touched the sample cell with hand and any part of his body, and nobody was allowed to take pictures so as to avoid the effect by outside energy (the photoflash). However, Qigong master could choose different Qigong style or intention, and decide how long time he needed for the Qi emission in each session, which usually lasted from one to five minutes, recorded by stop watch. After each session of Qi emission, the intention or Qigong style was recorded by interviewing the Qigong master; meanwhile, both treated sample and reference cells would be carried to the testing room for the operator to re-measure the CD spectra of both cells in a blinded fashion (without knowing the treatment identity of the quartz cells). Finally, the project director and the instrument operator got together with the experimental data to compare the possible differences between baseline measure and the sequential measure.

In responding to the suggestion of Dr. Philips Skell, a member of the U.S. National Academy of Science who was invited to observe the experiment, the procedure for the last RNA sample was different from others. In the last experiment, the sample cell stayed in the CD spectrometer after the baseline measure without being touched. The Qigong master attempted to emit Qi through two layers of metal covers for 2’19”, then the sample was re-measured on its CD spectra.

3. **Results**

Table 1 presents the result of 10 samples of poly-D-glutamic acid with 6 exposed to Qigong and 4 control or reference samples. The result shows that, under the effect of External Qigong, in 4 out of 6 experiments (67%) the magnitude of change in the ellipticity θ of the character peak on CD spectra was more than three standard errors (MSE); one had a change of more than two standard errors. The ratio of elliptisity change $\Delta\theta$ to θ before effect by Qigong ($\Delta\theta/\theta_{Qi\text{-}before}$) was over the range of 1-10% with the maximum change as large as 10.9%. Under the same condition, the reference sample without the effect of Qigong showed only minimum change within the range of standard error in the ellipticity θ of the character peak on CD spectra.

Table 2 presents the results of 4 experiments with RNA samples, 3 treated by Qigong and 1 untreated control, which show no significant change in the ellipticity θ of the character peak on CD spectra in either condition. No significant change was observed in the last experiment when the Qigong master emitted Qi directly toward to unmoved cell in the spectrometer.

4. Discussion

Table 1 shows that the External Qi of Qigong may change the reading of the CD character peak for poly-D-glutamic acid sample, suggesting the possibility of change in the molecular conformation. However, Table 2 shows that RNA like poly (I).(C) did not have any significant change in CD spectra after the similar exposure to external Qi, implying that there was no change in its conformation.

In 1998, the experts in the Chinese Committee for Verifying the Existence of External Qi in Qigong proposed the following criteria: when verifying the existence of External Qi with advanced equipment, the change of the peak values in the spectra must be greater than 3 standard errors in order to confirm the significance of the observed change. The equipment used in this study, CD Spectrometer Model 62DS (Lakewood, NJ), has an advanced function to offer the standard error for each measurement in addition to the digital result of CD spectra. Therefore it provided us with relatively reliable data to judge the significance of observed change. This study used the above criteria to make judgment on the significance of change, and concluded that the exposure to the External Qi made significant change in conformation for poly-D-glutamic acid, but not RNA samples.

The change of biomolecule conformation in the liquid usually happens in the following cases: when any factors such as temperature, concentration, pH value and solvent are changed; when other additives which can affect the property of the solvent are put in; when the materials such as metallic ions, different protein and small molecules, etc, that can combine with the biomolecule are added in the liquid. In this experiment all of the factors mentioned above were fixed in the system, the only outer influence was the way Qigong master discharged his External Qi to the sample. The control was the sample without the Qigong master's affect under the same conditions. Results demonstrated that the CD spectra of the test samples after affected by Qigong have changed obviously. About 67 % of the Qigong test samples showed positive change in our experiments. The ratio of elliptisity change $\Delta\theta$ to θ before effect by Qigong ($\Delta\theta/\theta_{\text{Qi-before}}$) was over the range of 1-10%. The variation of the CD spectra indicated that the change of molecule conformation of polypeptide has possibly taken place under the effect of External Qi from Qigong master.

It is very important to understand the relationship between Qigong master and the experiment itself for such a study. First, the Qigong master needs to learn what is the biomolecule conformation and also to understand how to emit External Qi to biomolecule to make change in its conformation. We spent a lot of time to discuss with the Qigong master on the model of the tested molecular structure with color pictures, which might help the Qigong master to establish the basic image of the tested biomolecule. As a Qigong master said that the more experiments he did, the better results he got. If we can select experienced Qigong masters and apply appropriate methods for the experiment the ratio of the sample changed might have increase. Second, the Qigong

master needs a good and positive status of both mind and body before the study so that he can concentrate on the specific intention or Qi emission process. Third, during the experiment, Qigong master needs to have a clear and effective "intention" or idea, such as repeated thinking of "more orderly, increasing helix;" or "more disorder, reducing helix" etc. In the experiments presented in Table 1 the Qigong master used mostly the intention of "more disorder and reduced helix" except for No. 9, which produced change in CD spectra in two opposite directions. Therefore, there seems some connection between what the Qigong master thinks and the direction of the change. Finally, the style or form that the Qigong master practice and the strength of the Qigong energy may also affect the magnitude or significance of the change. We have tested more than 20 Qigong masters, the Qigong master working in this study was a well-know medical Qigong master, and had offered anti-cancer intensive medical Qigong in China for eight years with excellent outcomes. His strong Qigong founction made this experiment successful with better results.

As to the no significant change in RNA sample, it is not conclusive for us since it was the first time for us to test such a sample. We are not sure weather it is due to the inappropriate understanding of RNA conformation, or there may be not way to affect RNA conformation by Qigong. More studies on DNA and RNA samples are needed in this type of studies in the future.

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Table 1. The Results of Elliptisities θ and Molar Elliptisities Δ[θ] on CD Spectra for poly-D-glutamic Acid before and after the Treatment

(C = 1.000 × 10^{-5} mol/L. pH = 5.88, T = 25°C)

No.	Treatment	λ/nm	θ_1/mgdr	θ_2/mgdr	Δθ / mgdr	MSE/mdgr	*Δ[θ]
1	Qigong	218	-7.674	-7.054	+0.620	0.150	+3.10
2	Control	218	-8.805	-8.507	+0.298	0.122	+1.49
3	Qigong	218	-12.260	-11.288	+0.972	0.155	+4.86
4	Control	218	-12.223	-12.056	+0.147	0.170	+0.74
5	Qigong	218	-11.366	-10.127	+1.239	0.132	+6.20
6	Control	217	-9.891	-9.854	+0.037	0.132	+0.19
7	Qigong	218	-11.746	-11.321	+0.425	0.184	+2.13
8	Control	218	-11.810	-11.926	-0.116	0.184	-0.58
9	Qigong	217	-9.637	-9.961	-0.324	0.164	-1.62
10	Qigong	217	-9.961	-9.343	+0.618	0.164	+3.09

Note: MSE – mean square error; $\Delta\theta = \theta_2 - \theta_1$

$*\Delta[\theta] = \Delta\theta / (c \cdot l)$ = number in table × 10^4 dgr· cm^2 · $dmol^{-1}$

c- The concentration of the solution; *l*- The pathlength of the cell

Table 2. The Results of Elliptisities θ and Molar Elliptisities Δ[θ] on CD Spectra for RNA Samples before and after the Treatment

(C = 6.00 × 10^{-4} M/bp. T = 25°C)

No.	Treatment	λ/nm	θ_1/mgdr	θ_2/mgdr	MSE/mgdr	Δθ /mgdr
1	Qigong	277	11.018	10.944		-0.054
		308	-3.645	-3.644	0.064	0.002
2	Control	280	9.793	10.268		0.475
		305	-4.123	-3.638		0.484
3	Qigong	277	10.052	10.071		0.019
		308	-4.030	-3.752		0.305
4	Qigong*	308	-3.579	-3.535	0.068	0.045

Note: MSE – mean square error

* The sample with direct Qi emission to the equipment.