

# Healthy Education Exercise Prevention and Treatment Prescription for Senile Dementia

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## ABSTRACT

In recent years, the incidence of senile dementia is rising rapidly that have seriously affected lives of senility. This article generally describes senile dementia classification, pathology and symptoms, analyzes the influence which exercise has on central nerve system of senility, and approaches how to formulate exercise-prescription for such people. Research shows that moderate exercise for a long time can reduce the loss in the anterior horn of spinal cord neurons in the aging process; it means that exercise has a protective effect on neurons. In addition, exercise can improve spatial learning behavior, but clearly shows that exercise plays a positive role in prevention of brain aging. Various forms of exercise can help pyramidal cells dendritic spines within the cerebral cortex on the rise, therefore, physical exercise can improve the function of cerebral cortex, strengthen people's intelligence. In addition, exercise to a certain extent can reduce anxiety; old people who take frequent exercise have a better cognition, better sensory memory, short-term memory and long-term memory than those who do not. In general, old people who take frequent exercise have short reaction time in need to do concentrate work, which is of great significance to delay the onset of senile dementia.

**Keywords:** senile dementia, exercise prescription, health education

## INTRODUCTION

With the progress of medicine and health, the popularization of health care knowledge, the average age of global human and the proportion of elderly population are significantly increasing year by year. At present, the aging population in China has reached 136 million, accounting for 10.2% of the total population. Meanwhile social problems of aging are also serious; senile dementia among them must be paid more attention to. In the domestic survey, there are 2.2%--4.7% senile dementia patients in over 60 years old population (Feldman et al., 2012; Parks-Stamm et al., 2017). Forecasters say that senile dementia will be one of the most serious diseases threat to human health in the 21st century. Therefore, this paper discusses how to prevent the occurrence of senile dementia has important social significance (Larson et al., 2012; Kinkead-Clark, 2017).

Senile dementia is associated with the aging of brain disorder, and dementia as the main symptoms of disease. According to its aetiology mainly divided into cerebrovascular disease dementia type, cerebral atrophy degeneration dementia type as well as the hybrid of the two. Sometimes it is difficult to identify three kinds of disease clinically (Brookmeyer et al., 2013; Mayer, 2017).

The disease is the basic pathology of cerebral atherosclerosis. Hardening of arteries is vascular changes associated with the increasing age, its formation has a variety of reasons. Hypercholesterolemia is one of the reasons making the elderly vascular changes to cause atherosclerosis. In addition, the change of calcium content in the blood vessel walls causes elastic fibre necrosis is another reason (Abbott et al., 2014; McLean et al., 2017). The degree of cerebral arteriosclerosis makes big difference because of different parts of brain. Generally, artery and basal artery of brain cause hardening easily, and seldom happens in arteria cerebra anterior and posterior cerebral

### Contribution of this paper to the literature

- At present, the aging population in China has reached 136 million, accounting for 10.2% of the total population. Meanwhile social problems of aging are also serious; senile dementia among them must be paid more attention to.
- Exercise research data about the role of the central nervous system shows, exercise can improve psychomotor function declining while age increases through slowing down the age related function of dopamine system.
- Recent research shows that moderate exercise for a long time can reduce the loss in the anterior horn of spinal cord neurons in the aging process, this shows that exercise has a protective effect on neurons.
- Exercise can improve spatial learning behavior, but also clearly shows the positive role of exercise in prevention and control of brain aging.

artery (Barnes and Satariano, 2013; Ballou and Springer, 2017). Most likely to happen in basal ganglia of small artery, the small artery of cerebral cortex is not easy to happen.

Clinical manifestations often accompanied by pyramidal system and extrapyramidal symptoms except with progressive dementia, attacked by the disease slowly, progressive develops, and the symptoms is mainly dementia (Lithell et al., 2013; Taggart, 2017).

This disease is different with cerebrovascular type dementia, the latter is based on cerebrovascular disease, causes secondary nerve cell function decline, and further formation of physical change (Scott et al., 2017; Guterman, 2017); This disease is caused by primary degeneration or shrinking of nerve cells, the cause is not fully clear, presumably could be related to genetic, autoimmune, and chronic viral infection and other factors.

## SIGNIFICANCE

Morphological features are different degrees of diffuse brain atrophy, obvious loss of nerve cells, and characteristic changes of “age spots” and “Nerve Fiber Tangles” (the two disease common in frontal lobe, hippocampus and amygdala). In addition, has study found that with the reducing of glucose metabolic enzymes, glucose metabolism is affected in turn meanwhile. Brain energy source mainly comes from glucose metabolism, if energy is in short supply, nerve cells will shrivel and loss (Welsh et al., 2014; Gunter and Reeves, 2017).

Clinical manifestations are characterized as senile forgotten and memory comprehensive loss, accompanied by a loss of memory, directional force also appears obstacles (Atapattu et al., 2017; Paredes, 2017). In addition, different with cerebrovascular dementia, patients often have no obvious positive signs in nerve examination, forgetting is characteristic of the disease, and far more severe than cerebrovascular dementia with rapid progress, while local signs is not obvious.

## MATERIALS AND METHODS

### Participants

Choose 32 patients with senile dementia, 19 males, 13 females, aged 61 ~ 82. Consult from patient's family members about exercise at ordinary times. Choose old patients with same gender, same age but has no obvious mental decline and no severe basic diseases in the same period to compare (Rosen et al., 2014; Ding et al., 2017).

### Program

Make records about daily exercise, including daily walking time and mileage of each old people.

### Methods

Using SPSS 11.0 statistical software for data analysis, the comparison of measurement data using t test, the results with  $P < 0.05$  for the difference was statistically significant.

## Results and Analysis

Daily exercise time: senile dementia group was 0~2 (0.44±0.07) h; contrast group was 1~3 (1.93±0.82) h. Daily exercise mileage: senile dementia group was 0.1~0.5 (0.26±0.09) km; contrast group was 3.0~5.5 (4.16±1.12) km. The daily movement time of contrast group was significantly more than senile dementia group, comparing difference of the two groups was of statistically significance ( $t=10.3$ ,  $P<0.05$ ); the daily movement mileage of

contrast group was significantly more than the group of senile dementia, comparing difference of the two groups was of statistical significance ( $t=19.6$ ,  $P<0.05$ ).

Onset age of senile dementia patients with more than 2 h daily walking time is 67~82 ( $75.8\pm 6.3$ ) years old; onset age with below 2 h is 61~74 ( $67.4\pm 6.8$ ) years old. Onset age of daily walking time  $\geq 2$  h people is obviously later than  $< 2$  h people, the comparison difference between the two groups has statistical significance ( $t=3.92$ ,  $P<0.05$ ); The onset age of the group with more than 3 km daily walking distance is 69~82 ( $76.1\pm 6.5$ ) years old; 3 km below is 61~73 ( $67.7\pm 5.2$ ) years old; onset age of the group with  $> 3$  km daily walking distance is later than the group with  $\leq 3$  km obviously, the two comparative difference was statistically significant ( $t=4.05$ ,  $P<0.05$ ).

## DISCUSSION

The effect of exercise on the elderly of the central nervous system is obvious. The main factor influencing life is exercise, diet, environment and personality, etc. Finnish scientists reported: the death rate of people who often have exercise is 56% lower than those who do not (Hardy and Totman, 2017); the death rate of people who have occasional exercise is 23% lower than sedentary people who do not. American scholars observed that death rate of no exercise people aged over 80 is 10 times higher than that of the exercise people (Zhang, 2017; Costa and Miranda, 2017). Thus, it can be seen that exercise is a great influence to human life, because exercise can delay the aging process and enhance human body's immune ability, make the biological age lower than the actual age. Moderate exercise can make good effect on each system function of human body, exercise is one of the important means to delay the aging of brain (Luo et al., 2017).

Frequent appropriate exercise can strengthen blood circulation of human body, accelerate gas exchange and open imperceptible blood-vessel of whole body, so that the brain can get enough oxygen and nutrients. Taking part in exercise frequently can increase RNA of brain, so that brain cell can get more oxygen to function (Fang, 2012). At the same time, exercise have a positive effect on increasing blood flow, number of red blood cells and hemoglobin content. Besides, people who often engage in exercise activities can enhance acid and alkali resistance of brain tissue and oxidase system function, benefit to the improvement of memory and thinking ability (Hao et al., 2017).

Frequent and appropriate exercise can make improvement of excitability, flexibility, balance and coordination of centers during the activity process of cerebral cortex nerve, make brain tension eased, and shorten response latency, which makes efficiency of work. At the same time, exercise can strengthen the activity of superoxide dismutase (SOD) of the elderly in red blood cells; thereby reduce the precipitation of cerebral cortex fat brown pigment, and delay the aging of the brain (Rieber, 2017).

Exercise research data about the role of the central nervous system shows, exercise can improve psychomotor function declining while age increases through slowing down the age related function of dopamine system. Recent research shows that moderate exercise for a long time can reduce the loss in the anterior horn of spinal cord neurons in the aging process, this shows that exercise has a protective effect on neurons. In addition, exercise can improve spatial learning behavior, but clearly shows the positive role of exercise in prevention and control of brain aging (Hu et al., 2017; Judd and Elliott, 2017; Lai et al., 2017). In many animal experiments we can see that the various forms of exercise can help the rising of pyramidal dendritic spine of cerebral cortex cells, therefore, exercise can improve the function of cerebral cortex, can strengthen the intelligence. In recent years, taking exercise as the prevention and control measures of brain aging is quite popular in Europe and the United States.

Frequent and appropriate exercise can reduce the incidence of cardiovascular disease. The main cause of cerebrovascular dementia is cerebral atherosclerosis, which associated with dyslipidemia, namely the plasma triglyceride (TG), total cholesterol (TC) and low-density lipoprotein (LDL) increase, and high-density lipoprotein (HDL) decrease phenomenon. Because of LDL erosion to artery wall lining, and sedimentary in the artery wall to form lipid plaques, so the dyslipidemia is a risk factor for atherosclerosis. Long-term aerobic exercise can promote plasma TG hydrolysis, reduce plasma LDL levels, and improve dyslipidaemia. Because plasma HDL can prevent atherosclerosis, so the increasing of plasma HDL and the decreasing of LDL can reduce the risk of cerebral arteriosclerosis.

In addition, to a certain extent, exercise can reduce anxiety, most cross-sectional study shows that some old people who take frequent exercise can have a better cognition than those who don't, and have short reaction time in need to concentrate and responsive work. Experiment has shown that the experimental group who long-term adherence to exercise have better memory, short-term memory and long-term memory than contrast group.

## SOLUTION

Old people has to pass strict body inspection before exercise, especially to do detailed cardiovascular examination, old people should pay attention if potential disease and risk factors are discovered. Exercise prescription of old people mainly take "safety" as the ultimate goal. Patients who have sinus arrhythmia, diabetes,

high blood pressure, myocardial infarction, arteriosclerosis and obesity must have doctor's examination, follow the doctor's instructions, and make exercise prescription, do not act blindly.

There is not a health exercise method absolutely applicable to everyone in the world, according to personal purpose, physical ability, health status, personality, hobbies, etc. one's own physical fitness, targeted to choose suitable health exercise method --exercise prescription. The key point of prescription is the easy content, avoiding competitive exercise; choose exercise intensity with heart rate around 120 times/min, for 60 min each time, 3 times a week.

Although many exercise, old people can attend, but some exercise events are thought by some scholars more beneficial to the old people's physical health, such as tai chi chuan, jogging, brisk walking, swimming, mountain climbing, ballroom dancing, and qigong, etc. A Japanese scholar found that Chinese tai chi chuan can increase significantly the functions on nervous system, cardiovascular system, digestive system and endocrine system. During practicing tai chi chuan, use mind guide action and action follow mind, most areas of cortex are in a wide range of inhibition except the exercise center and the second signal system of brain cortex are in highly excitement. This negative induction from exercise center excitement to surrounding area can inhibit chronic pathological excitement, ease the original disease, and even to heal. Jogging is one of the most simple and feasible means of fitness, jogging had been thought to be the most health beneficial aerobic exercise, can prevent brain over fatigue and neural dull.

In addition, finger movement is a kind of simple and effective method to improve memory and delay nerve cell senescence. For example, often use finger spinning steel ball or walnuts, or stretched hands clenching movement. Japan in recent years abacus leads a wave, in abacus finger movement can stimulate brain, exercise left brain, to promote the development of intelligence.

## CONCLUSION

Experts believe that the health of human beings is not entirely rely on medicine, nutrition, but exercise is one of the important factors to promote human health. In human progress, social development today, exercise has become a modern basic pursuit of healthy living. In a word, scientific and suitable exercise, reasonable nutrition and optimistic state of mind are important means to prevent senile dementia and improve healthy living level of old people.

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