International Journal of Cardiology 117 (2007) 293–295

International Journal of Cardiology

www.elsevier.com/locate/ijcard

Editorial

Tai Chi: The Chinese ancient wisdom of an ideal exercise for cardiac patients

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Received 7 June 2006; accepted 7 June 2006
Available online 9 August 2006

Tai Chi, the shorter version of Tai Chi Chuan [1], is a form of ancient Chinese martial art with slow and graceful movements. It is also a mind–body relaxation exercise [1]. Tai Chi was originally devised in about 960 during the Song dynasty by Chang San-fung [1,2] for meditation and self-defence [1,3]. Contrary to the northern, external form of boxing (shao-lin based on muscular strength), Tai Chi was a southern internal form based on suppleness and the art of evasion. The idea was to oblige one's opponent to exert efforts as considerable as they were useless and so put him into an unfavorable position [2]. Over the years Tai Chi has become more focused on health promotion than as a martial art. It is now a very popular Chinese conditioning exercise practiced all around the world.

The effect of Tai Chi on health outcomes in patients with chronic diseases has been extensively reviewed over the years [4–8]. In particular, the benefits of Tai Chi in patients with cardiac diseases were the subjects of several recent articles [9–13]. In addition to those discussed in these articles – enhanced cardiovascular function, increased strength, increased balance, decreased falls, reduced pain perception, reduced anxiety and improved self-efficiency – there are several additional effects of Tai Chi in cardiac patients that will be the subjects of this article.

First, Tai Chi is effective in treating patients with hypertension [8,14–18]. The effect is greater for systolic than for diastolic blood pressure which is dependent upon elasticity in the arterial wall [15,17]. Whether the blood pressure decrease is a consequence of the mental or physical relaxation aspects of the exercise is still under investigation [15].

Second, Tai Chi has a salutary effect on lipid profile, Tsai et al. [14] reported that, after 12 weeks of Tai Chi serum total cholesterol level decreased 15.2 mg/dL and high-density-lipoprotein cholesterol increased 4.7 mg/dL.

Third, Tai Chi can enhance microcirculatory function in healthy elderly men [19]. Wang et al. [19] found higher skin blood flow, higher cutaneous vascular conductance, and higher skin temperature at both rest and during exercise in geriatric Tai Chi practitioners than in sedentary men with matched age and body size.

Fourth, the vascular endothelium modulates vascular tone by synthesizing and metabolizing vasoactive substances; endothelium-dependent vasodilatation declines with age [20]. Regular practice of Tai Chi is associated with enhanced endothelium-dependent dilatation in skin vasculature of older individuals [20]. Furthermore, Tai Chi may delay the age-related decline of venous compliance and hyperemic arterial response [20].

Fifth, Tai Chi has been shown to acutely increase heart rate variability in both young and old male healthy subjects [21]. Decreased heart rate variability has been used as a predictor of sudden cardiac death in a variety of disease states including heart failure [22] and mitral valve prolapse [23]. Whether Tai Chi has a permanent effect in cardiac patients is not yet definitely established.

Sixth, Tai Chi has a special role in the management of patients with chronic heart failure [9,10,24–26]. In chronic heart failure there is increased cardiac adrenergic drive that, though initially supportive, is ultimately detrimental to the failing heart. Tai Chi has a modulating effect on the autonomic nervous system by enhancing the vagal modulation and tilting the sympathovagal balance toward decreased sympathetic modulation [27]. A detailed study involving 150 patients with chronic heart failure was started in mid 2005 at

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0167-5273/$ - see front matter
doi:10.1016/j.ijcard.2006.06.021

Fig. 1. Ten thousand people practicing Tai Chi in Tiananmen Square. Courtesy of People's Daily, Beijing, China.

Harvard [26]. The findings which undoubtedly would enhance the understanding of how Tai Chi may help patients with chronic heart failure are on the horizon.

Seventh, patients recovering from coronary artery bypass surgery routinely receive cardiac rehabilitation services of which exercise is an integral component. However, they can be expensive, inconvenient or not readily accessible, because of the need of special facilities or expensive equipment. Tai Chi seems to be ideally suited as an alternative for several reasons: (I) Tai Chi does not need special facility or expensive equipment and it can be practiced anytime and anywhere. (II) Tai Chi is effective for enhancing cardiopulmonary function and other fitness traits [28]. (III) Tai Chi, because of its low cost and low technology, may be easily implemented in the community [29]. (IV) Tai Chi, being a low-intensity exercise, is especially suited for the unfit and elderly patients [28].

Eighth, patients recovering from stroke may also benefit from Tai Chi. Tai Chi emphasizes slow, rhythmic movements with constant weight shifting, trunk rotation, a changing base of support with a lowered center of gravity (i.e., knees and hips held in flexion) and an elongated central axis around which all motion occurs [30]. Therefore, Tai Chi can improve balance and walking [30], as well as muscle tone and even thinking abilities [31].

Ninth, Tai Chi also has a positive effect on the psychosocial status among people with cardiovascular disease risk factors [32]. Statistically significant improvements in all measures of psychosocial status were found: improvement in mood state, reduction in perceived stress, increased self-efficacy to overcome barriers to Tai Chi, confidence to perform Tai Chi, and perceived social support [32].

Finally, the word 'Chi' in Tai Chi should not be confused with the word 'Chi' in Chi Kung (or Qi Gong in the modern pinyin system of romanization of Chinese) [33]. Tai Chi (太極) is the shorter version of Tai Chi Chuan, which is 太極拳 in Chinese. The word 'Chi' here stands for the Chinese character 極 which is not the same as 'Chi' or 'Qi' (氣) in Qigong (氣功) which is another form of ancient Chinese healing art. Qi (氣) in Qigong means energy, whereas Chi (極) in Tai Chi (or Tai Ji in pinyin system) means top or peak or most or very [34]. Some of the confusion arises unfortunately from Chinese conversion from the old Wade-Giles to the modern pinyin system of romanization.

In conclusion, Tai Chi represents the ancient Chinese wisdom of an ideal conditioning exercise, not only for healthy elderly people but also for cardiac patients including those with chronic heart failure. It has been widely practiced in China for centuries by people of all ages and both sexes (Fig. 1). No wonder it has been labelled 'the perfect exercise' [35]. With the help of modern technology in medicine, Tai Chi is expected to be one of the most challenging and exciting fields of research not only in cardiology but also in medicine in general.

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