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Intracerebral haemorrhage and Qigong

腦出血與氣功

We report on a 65-year-old woman who presented with acute right-sided weakness because of an intracerebral (thalamic) haemorrhage. As a Qigong enthusiast with a long-standing history of hypertension, she developed a stroke syndrome soon after practising Qigong one morning. Following neurological recovery, the patient exhibited erratic blood pressure responses while practising Qigong, despite the fact that resting blood pressure was normal. The haemodynamic responses to exercise are discussed and a review of the therapeutic implications of practising Qigong is presented.

本文報告了一名65歲的婦女，她因腦(丘腦)出血而出現急性右邊身體無力的症狀。患者長期患有高血壓，並經常練習氣功，她於一天早上練氣功後突然出現中風的病徵。患者的神經系統復原後，平日的血壓也回復正常，但在練氣功時出現血壓不穩。本文討論了運動時血液動力學的反應，並總覽了氣功中與治療有關的部份。

Introduction

The incidence of stroke—usually the third most common cause of death in Hong Kong—is estimated at approximately 1 to 2 cases per 1000 of population.[1] Intracerebral haemorrhage occurs in approximately one third of these cases and is two to three times more frequent in ethnic Chinese than in Caucasians.[2] Cerebral haemorrhage is due to the irruption of blood into the brain parenchyma, usually from the rupture of a small perforating artery.

Traditional therapeutic exercises are widely practised in China and some, such as Tai Chi, have also gained popularity in the West. Literature on Tai Chi has shown that there are no adverse haemodynamic effects during its practice.[3,4] The haemodynamic effects of some other traditional Chinese exercises, however, are not well documented. We report on a woman who was a Qigong enthusiast and presented with an acute thalamic haemorrhage.

Case report

The index case was a 64-year-old woman who presented with her first ever attack of acute right-sided weakness soon after practising Qigong one morning in September 2000. The weakness reached its maximum in 15 minutes and then gradually improved. She presented herself to an emergency department and was subsequently admitted to Queen Mary Hospital for further management.

This woman had a previous history of goitre and hypertension, which were not receiving any medical attention. Her family history was

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unremarkable. She did not smoke or drink. Both she and her husband were Qigong enthusiasts and believed that they could regulate their blood pressure by practising Qigong regularly.

Assessment a few hours after the onset of symptoms revealed mild grade 4/5 right hemiparesis. The Glasgow Coma Scale score was 15. Cranial nerves were not affected, except that there were grade 2 hypertensive changes on fundoscopic examination. Speech, swallowing, sensory, and sphincter functions were not affected. A clinically euthyroid goitre was noted. Blood pressure level was moderately increased at 190/110 mm Hg. The rest of the physical examination was normal.

An urgent non-contrast computed tomography scan of the brain revealed a left thalamic haemorrhage. As there was no mass effect and the patient was improving neurologically, she was managed conservatively. A laboratory investigation was normal, except that mild diabetes mellitus was confirmed. An electrocardiogram showed left axis deviation and left ventricular hypertrophy by voltage.

The patient remained neurologically stable after admission, although blood pressure level was persistently elevated (180/105 mm Hg). In view of the evidence of chronic hypertension, amlodipine was slowly added to achieve a modest blood pressure control.

Five days after the acute event, the patient was transferred for stroke rehabilitation. In the rehabilitation unit at Tung Wah Hospital, she gained almost full functional recovery. By now, blood pressure and blood sugar were under optimal control. The patient even resumed practising Qigong, along with the usual physiotherapy and occupational therapy training. The type of Qigong that she practised consisted of a lot of isometric elements. From the authors' experience, the injudicious practice of isometric exercise, especially with breath-holding, can induce surges in blood pressure. Hence, continuous blood pressure recording was conducted using a 24-hour ambulatory blood pressure monitor while the patient practised Qigong. Blood pressure was recorded every 3 minutes after Qigong was commenced. The resulting blood pressure profile is shown in the Table and the Fig. The results demonstrate that within 3 minutes of starting Qigong, both systolic and diastolic blood pressure increased to a relatively high level, and remained elevated for about 35 minutes. The mean systolic blood pressure was 162.3 mm Hg (standard deviation [SD], 12.8 mm Hg) and the mean diastolic blood pressure was 99.4 mm Hg (SD, 5.1 mm Hg). The findings were presented to the patient and it was suggested that she avoid performing Qigong activities that caused blood pressure elevation.

The patient was discharged 2 weeks after the onset of stroke, with full independence in daily living activities, including walking.

Discussion

Exercise and haemodynamic responses

Muscle contractions can be divided into two categories: static and dynamic. Static or isometric contractions are those in which there is no movement of the load on which the muscle is acting. Dynamic contractions, on

Table. Blood pressure and pulse profile

Measurement	Time	Blood pressure (mm Hg)		Pulse (beats/min)
		Systolic	Diastolic	
1	9:51	173	100	114
2	9:54	153	102	118
3	9:57	161	96	117
4	10:00	152	95	116
5	10:03	160	98	114
6	10:06	153	100	113
7	10:09	157	96	107
8	10:12	191	112	125
9	10:15	172	100	125
10	10:18	151	95	99
Mean (SD*)		162.3 (12.8)	99.4 (5.1)	114.8 (7.7)
11	10:21	141	89	114
12	10:24	157	95	117
13	10:27	144	73	102
14	10:30	163	87	134
15	10:33	136	86	126
Mean (SD)		148.2 (11.3)	86.0 (8.1)	118.6 (12.2)

* SD standard deviation

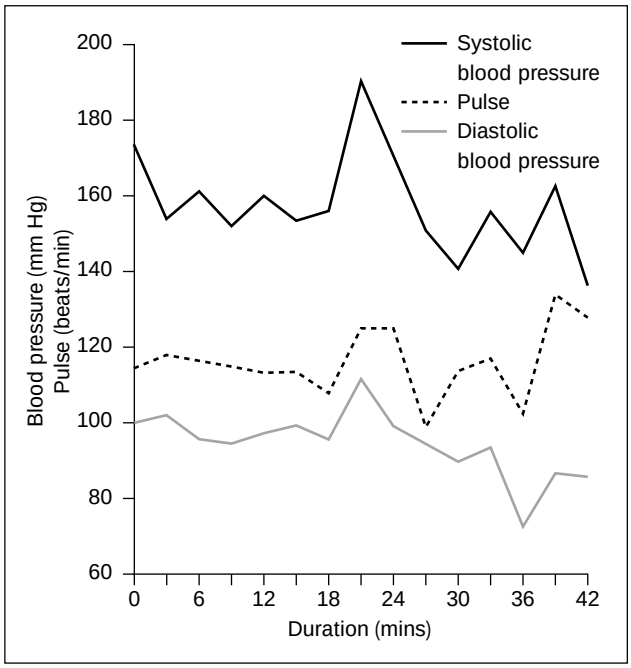

Fig. Blood pressure and pulse profile

the other hand, involve muscle shortening or lengthening. Many of the cardiovascular adjustments to dynamic exercise are regulated by changes in autonomic activity outflow. Parasympathetic tone exists at rest, and its withdrawal at the onset of exercise allows heart rate to rise. When work intensity reaches the point of 50% of maximal oxygen consumption (VO_2), parasympathetic withdrawal appears to be exhausted, and any further rise in heart rate is totally dependent on increased sympathetic activity. Systolic blood pressure progressively rises with increased dynamic workload, whereas diastolic blood pressure generally remains relatively unchanged. The net effect is a modest increase in mean arterial blood pressure (usually less than 20 mm Hg). Total systemic vascular resistance declines progressively with increasing work intensity. The precise mechanisms leading to vasodilatation in active muscles remain debatable, but are likely to stem from changes in several local factors, including osmolarity, pH, potassium concentration, and levels of endothelial relaxing factor and adenosine.

The haemodynamic responses (increases in VO_2, cardiac output, and heart rate) are typically modest during static exercise compared with dynamic exercise. Additionally, total peripheral vascular resistance does not decrease, and stroke volume usually fails to rise, as occurs with dynamic exercise. Mechanical and metabolic activation of skeletal muscle afferent nerve fibres during static exercise evokes a pressor response that leads to a significant increase in blood pressure, especially in mean arterial blood pressure and diastolic blood pressure. For this reason, static exercise is often viewed as placing primarily a pressure load on the left ventricle, whereas dynamic exercise is viewed as placing more of a volume load on the left ventricle.[5]

Qigong and health

Qigong for health maintenance and promotion has a therapeutic concept reliant on traditional Chinese medicine and has been practised for hundreds of years. It is estimated that 5% of the current 1.3 billion Chinese population perform this traditional exercise[6] which, broadly speaking, can be of either a dynamic or static variety. Unfortunately, the therapeutic effects of Qigong are seldom reported in the western literature. Nevertheless, recent attention has focused on this technique for treating chronic disorders, including cardiovascular disease.[7] A number of studies have shown that properly practised, Qigong can reduce blood pressure.[8,9] Sancier[10] conducted a review of the evidence available and concluded that combining Qigong and drug therapy for hypertensive patients could reduce the dosage requirement for blood pressure control, as well as the incidence and mortality of stroke.

The patient in this study, however, had a history of hypertension lasting for some years and, in view of the fact that she was not under medical attention for this, it was questionable whether her blood pressure control was optimal. There is a potential risk in practising Qigong under these circumstances. Certainly, the results of her continuous blood pressure monitoring support this point.

The authors would like to point out that Qigong, with its intrinsic exercise element, definitely has some effect on blood pressure. For patients who are hypertensive, or at risk of cerebrovascular or ischaemic heart disease, objective blood pressure measurement is thus desirable. O'Connor et al[11] have shown that the Valsalva manoeuvre (breath-holding) is the prime factor causing an elevation of blood pressure during isometric exercise. Hence, proper instructions to avoid breath-holding are important for susceptible patients who wish to practise Qigong.

Conclusion

This report illustrates a case of intracerebral haemorrhage related to suboptimal blood pressure control. In addition, it documents erratic blood pressure elevation in this patient while she was practising Qigong, which is a very common form of Chinese therapeutic exercise. Disregarding the possible therapeutic benefits of Qigong, one should remember that the exercise

component will undoubtedly have an effect on blood pressure. We thus recommend that persons wishing to practise Qigong have a general body and blood pressure check before embarking on this, or any other form, of vigorous exercise. For those with hypertension, we recommend that they have meticulous blood pressure control and undertake proper breathing instructions.

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