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How to prevent dementia in Hong Kong



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Multidomain interventions: How to prevent dementia in Hong Kong

Professor Timothy Kwok, Director of Jockey Club Centre for Positive Ageing details multidomain interventions to prevent dementia in Hong Kong, underlining important areas like primary prevention, physical exercise, diet and mild cognitive impairment

On dementia prevention, when you bear in mind the issues of population ageing and longevity, Hong Kong is now facing the challenge of a rapid increase in the number of people with dementia during the coming decades. Yet the public health care and long-term care systems in Hong Kong are ill-prepared for the burgeoning number of people with dementia who require much personal care. As such, a great strain on families, health and social care services in Hong Kong is expected during the coming years.

Apart from reforms in health and social care systems to meet the increasing demand from dementia, it is very important to have public health care policies to promote dementia prevention. There is good evidence that dementia in old age can be delayed if not prevented. A comparative study in the UK showed that the age-sex prevalence of dementia has decreased by 1.8% over the last twenty years.¹ The World Health Organization (WHO) has identified dementia prevention as an important target worldwide.² By delaying the onset of dementia for people aged 70+ by five years, it is estimated that 40% of the societal costs can be saved.³

Primary prevention

Primary prevention starts with the prevention of mid-life obesity by promoting physical exercise and a healthy diet in people of all ages. The complications of obesity such as hypertension, diabetes mellitus (DM) and hyperlipidemia should be actively managed by primary health care teams. Primary health care in Hong Kong is primarily based on the work of private practitioners. Publicly funded general outpatient clinics have been giving priority to older people and those with known chronic diseases. More proactive public education to promote awareness of the importance of obesity, DM and hypertension among middle-aged people in determining health and cognitive function in later life may be helpful. This will constitute an important role of the coming publicly funded district health centres throughout Hong Kong. The district health centres provide multidisciplinary interventions at subsidised rates and organise health promotion activities. They are expected to work collaboratively with local primary care doctors and hospitals. Each district health centre is supported by a few satellites centres to improve accessibility.

Physical exercise

Physical exercise or activity is the most effective means to prevent cognitive decline even in old age. Mind-body exercise, for example, Tai Chi may have a more cognitive effect than other forms of exercise,⁴ though a year course of aerobic exercise was shown to increase sizes of the hippocampus.^{5,6} Our Jockey Club Centre for Positive Ageing (JCCPA) has developed an



eight-week coordination training which was a simplified version of Tai Chi and the cognitively-sound older participants were found to improve in global cognition after joining the training.⁷ More sports facilities, publicly accessible green space, public education on the anti-ageing effects of physical exercise, structured exercise programmes in community centres for older people all help to promote physical activities in older people.

Diet

Mediterranean dietary pattern prevents cognitive decline in older people. The current dietary pattern of healthy older people in Hong Kong is quite close to the Mediterranean diet.⁸ But some older people have limited vegetable and fruit intake because of poor dental status. One-third of older people were edentulous.⁹ Part of the reasons for poor dental status in older people in Hong Kong is due to the lack of public investment in dental care, especially in older people.

Air quality

Air pollution has been associated with cognitive decline in epidemiological studies.¹⁰⁻¹² Air quality in Hong Kong is not good because of the high population density and the great number of cars and vehicles. Exposure to green space is associated with reduced risks of mortality and improved frailty status in older people in Hong Kong.^{13,14} Also, the common use of incense indoors for ancestral or religious worship in Hong Kong has been associated with cognitive decline in older people.¹⁵ The creation of green space in built-up areas, better ventilation with cooking, avoidance of indoor incense burning, an indoor air purifier may promote brain health in the longer term.

Mild cognitive impairment

Dementia is more often than not preceded by a period of mild cognitive impairment (MCI), especially in memory. The annual conversion rate from MCI to dementia varies from 10% to 15%,¹⁶ depending on the degree of neuro-



degeneration at presentation. At present, few of these people seek medical help because there is no established treatment for MCI and most people would attribute it to ageing.

Nutritional supplement for MCI

Some, however, would resort to taking nutritional supplements in the hope that they may improve cognitive function. Indeed this is a big market with an ever-increasing number of products, for example, ginkgo, omega three, B vitamins, curcumin. In Hong Kong, herbal medicine is a popular mode of primary health care. Not surprisingly, herbal compounds for brain health join the competition in this lucrative market. Some of these products have experimental data support, but very few of them have been evaluated by randomised trials in people with MCI and the few randomised trials did not show convincing results in overall cognitive function. Before there is such convincing evidence, it is hard for anyone to persevere with the nutritional

supplements over a long period of time, especially because they are not publicly funded.

Cognitive training in MCI

There is evidence that cognitive training can improve cognitive function in older people with MCI. A systematic review suggested that cognitive training benefits people with MCI in various domains, such as working memory, depending on the model of intervention. Cognitive training may also increase or maintain their brain activation and connectivity. It has been suggested that the brains of people with MCI are still plastic and as such, they can benefit from cognitive training.¹⁷ Another review, further suggested that frequent repetitive cognitive practices may yield better effects than memory strategy training in improving memory.¹⁸

Education is a strong determinant of cognitive function and a protective factor against

dementia. Yet the current older population in Hong Kong have a low-level education, especially for women. In two randomised trials of cognitive training between eight to twelve weeks in community-dwelling older people with memory complaints, we found that the participants with low education (less than secondary education) responded better than the better educated.^{19, 20} The latter group may require more intensive and challenging cognitive training to improve, as they may have more advanced brain degeneration when they start to complain about memory.

Cognitive training in small groups is more effective than by individuals.^{21,22} Social engagement may, therefore, enhance the effects of cognitive training. We have, therefore, designed a cognitive training programme with special emphasis on social interactions with programme worker and fellow participants. In the trial, we observed a significant improvement in verbal fluency and self-perceived social support, on top of improvement in cognitive function (unpublished data).

Another novel means of cognitive stimulating activities that JCCPA has developed in collaboration with another NGO is to engage some groups of older people with MCI in playing with toys and games. The advantages are the ease of administration, a relatively low manpower requirement, high acceptability by older people and the participation of volunteers. In the randomised trial of a toy library group for twelve weeks, we found a significant improvement in both cognitive functioning and quality of life for the intervention group, especially in those with a lower cognitive ability at baseline. (unpublished data)

People with MCI are commonly affected by apathy which leads to an unhealthy sedentary lifestyle. We have, therefore, tried out a cognitive training which combined with empowerment intervention intending to promote a healthy lifestyle. We have

performed a randomised trial of this approach in older people with diabetes mellitus and subjective memory complaints. People with diabetes mellitus were selected because chronic disease management is particularly important for their health. After the ten-week intervention, a marginal improvement in the memory domain was observed probably because of the relatively low dose of cognitive training i.e. ten hours in total. Most interestingly, however, memory improved further and became significant at nine months after the intervention. It is tempting to postulate that the empowerment programme which included group discussion, peer support, action planning etc. had promoted healthy lifestyle changes or better social relationships, which led to better cognitive functioning in the longer term.²³ We have since then further modified the format of the programme by delivering six chronic disease self-management sessions before four intensive cognitive training sessions. With this programme, we observed a significant improvement in cognitive functioning and self-perceived social support immediately after the intervention; (unpublished data) A one-year follow-up is to be conducted to further confirm the effectiveness.

Individual leisure activity may also help to improve cognitive function in older people. JCCPA conducted a randomised controlled trial on intensive calligraphy therapy for older people with mild cognitive impairment. In the trial, the old age home residents practised on calligraphy for half an hour five times a week for eight weeks. The intervention group was found to have significant improvement in global cognitive functioning, especially in orientation, attention and calculation.²⁴

Multidomain interventions to prevent dementia

All the above interventions are effective in older people with or without MCI. But the effect sizes of each intervention are probably limited and, therefore, difficult to demonstrate in randomised trials. It is possible that their

combined effects may be more substantial and detectable. The Finnish Geriatric Intervention to Prevent Cognitive Impairment and Disability (FINGER) is an intervention combining individual and group nutritional counselling, physical training in muscle strength and aerobic capacity, individual and group cognitive training particularly targeting episodic memory, executive functioning, mental speed and working memory, as well as medical review on management of metabolic and vascular risk factors and nurse counselling for positive lifestyle changes. In this landmark trial of 1,260 older participants with high vascular risks, this comprehensive training and care programme conducted in parallel over two years resulted in significant improvement in cognitive function in older people with vascular risks. The authors proposed that positive changes in various risk factors at the same time contributed to positive change in cognitive functioning.²⁵

Memory club

The mode of delivery of prevention interventions may, therefore, be critical to its success. That is why some years ago, JCCPA started to run a once-weekly memory club which incorporated cognitive training, empowerment, social stimulation, physical exercise and mindfulness exercises. The coming district health centres in Hong Kong may be an ideal platform to deliver multidisciplinary interventions for the prevention of dementia.

Conclusion

There is good evidence that dementia can be delayed or prevented. But a concerted and sustained effort will be required. Promotion of public awareness of dementia risk and public education of preventive measures need to emphasise the life course approach in dementia prevention.

There is a case for targeted preventive interventions in older people with mild cognitive impairment. Cognitive training in various forms is effective and may appeal to

older people with MCI. Its effects can be further enhanced by mind-body exercise, lifestyle advice, empowerment programme, social stimulating activities and primary health care. It is challenging to deliver these multidomain interventions in a regular and sustainable manner. According to our centre experience, once a week meeting at the memory club is an effective mode of service delivery. More randomised controlled trials of multidomain interventions that can delay the onset of dementia in at-risk older people are warranted.

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