

Exploration of High Risk Factors in Lifestyle for Mild Cognitive Impairment in Elderly People*

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ABSTRACT Objective: To explore the influence of risk factors in lifestyle to elderly mild cognitive impairment. **Methods:** With the score of (mini-mental state examination) MMSE, (Montreal Cognitive Assessment) MoCA, (Clinical dementia rating scale) CDR and the risk factors of life scale, the study investigated 219 elderly people aged over 60 years to analyze high risk factors in lifestyle of mild cognitive impairment. **Results:** The male was higher than the men in the risk of MCI ($P = 0.03$); The illiteracy group was higher than the Primary school group in the risk of MCI, middle school and above group was higher than the Primary school group in the risk of MCI ($P = 0.00$); The farmer group was higher than the worker group in the risk of MCI ;The worker group was higher than the management group in the risk of MCI ($P = 0.01$);The rural residents were higher than the urban residents in the risk of MCI ($P = 0.01$); The exercise influenced the incidence of MCI. Exercise group was higher than the non-exercise group in the risk of MCI ($P = 0.00$); The hobby influenced the incidence of MCI, A hobby group was higher than the non-hobby group in the risk of MCI ($P = 0.00$). Age was no significant difference in the risk of elderly MCI ($P > 0.05$); The groups between different smoking, drinking, drinking tea (the history of years, frequency, etc.) were no significant difference in the risk of elderly MCI ($P > 0.05$); Whether the lunch break or not, different frequency of lunch break and different sleeping hours per night were no significant different in the risk of elderly MCI ($P > 0.05$). **Conclusions:** gender, education level, occupation, place of residence, exercise and hobbies and so on had something to do with the risk of elderly MCI.

Key words: Mild cognitive impairment (MCI); Elderly people; Lifestyle factors

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Introduction

With the growth of age, the incidence of cognitive impairment was rising [1]. Some studies had shown that lifestyle Risk factors had some influence on cognitive function. The gender, age, education level were the influenced factors of cognitive impairment, while smoking, drinking, drinking tea on cognitive function studies had been reported mixed [2]. This study, on the basis of the above, detailed and observed old age factors in life, and investigated cognitive function for elderly people, and surveyed the risk factors in lifestyle for elderly mild cognitive impairment.

1 Materials and Methods

1.1 Object

The people, investigated in this study, were more than 60 years, with the official account in the local, with the layered, multi-stage, random sampling from cluster method, respectively in urban and rural areas in Qingdao city, from June 2008 to November 2010. 219 cases, of which 104 cases were male and 115 cases were female, 60-90 years old, all were conscious, able to meet the test, obtained informed consent before surveying. Basic sampling unit

was the neighborhood (urban) and village (rural). Exclusion criteria: ① consciousness impairment; ② aphasia, severe hearing and visual impairment; ③ serious heart, lung, liver, kidney and other diseases; ④ with previous history of psychiatric disease, and so on. There were 68 MCI patients. The mean MMSE score was 21.38 ± 3.68 ; The mean MoCA score was 18.12 ± 3.21 . MCI patients inclusion criteria: (1) Complained of memory loss, and memory difficulties confirmed by others; (2) Mini Mental State Examination (MMSE) or the Montreal Cognitive Assessment (MoCA) scored 24 to 30; (3) CDR was equal to 0.5, memory items score must be at least 0.5 points ;(4) the normal activities of daily living ;(5) Hamilton Depression Rating Scale score ≤ 12 points (17 items); (6) did not meet the criteria of dementia. The control group had 151 cases, MMSE score for normal cognition was 27.02 ± 2.40 ; MoCA score was 23.31 ± 3.47 . Elderly cognitive normal controls (NC) diagnostic criteria referred to previous literature [3].

1.2 Methods

(1) The《mild cognitive impairment questionnaire of diagnosis and intervention》for national "Eleventh Five-Year" Technology Support Program was used. Factors content: sex, age, educational level, residence, occupation, smoking, drinking, tea, sports, hobbi-

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es, lunch break. (2) Evaluation of cognitive function: applied the table of MMSE, MoCA, CDR and risk factors in lifestyle to evaluation cognitive function. (3) The composition of investigate: It was consisted of experienced clinical doctors in geriatrics. Firstly it was qualified training prior to the survey by unified questionnaires and standardized language to survey.

1.3 Statistical analysis

SPSS13.0 statistical software was used for data processing and analysis. Count data was using X^2 test, logistic regression analysis, $P < 0.05$ as significant meaning.

2 Results and analysis

2.1 The relationship between lifestyle risk factors and mild cognitive impairment (MCI)

2.1.1 General situation The 219 elderly people was with mild cognitive impairment (MCI) 68 case, 151 cases with normal cogn-

ition function.

2.1.2 The relationship of MCI and general demographic factors The gender influenced the incidence of MCI, the incidence of MCI ($X^2 = 4.55$, $P = 0.03$) was higher for the females than that for the males; The age had no effect on the incidence of MCI; The education level affected the incidence of MCI, the incidence of MCI for the illiteracy group was 50.8%, for the primary school group was second (29.7%), while which was 17.9% for the middle school ($X^2 = 18.03$, $P = 0.00$); The occupation influenced the incidence of MCI. The farmer was three times more higher than the management in the incidence of MCI. The workers was higher than the management personnel ($X^2 = 13.68$, $P = 0.01$); The place of residence influenced the incidence of MCI, The rural residents had higher incidence of MCI than that of the urban residents ($X^2 = 7.09$, $P = 0.01$) (Table 1)

Table 1 General demographic factors and the number and the percentage of MCI

General demographic factors	Group	NC	MCI(%)	X^2	P
Gender	Male	79	25(24.0%)	4.55	0.03
	Female	72	43(37.4%)		
Age	60-64years	27	6(18.2%)	3.36	0.50
	65-70years	51	23(31.1%)		
	71-75 years	42	22(34.4%)		
	76 -80 years	21	11(34.4%)		
	81 years and above	10	6(37.5%)		
Education level	Illiteracy group	30	31(50.8%)	18.03	0.00
	Primary school group	52	22(29.7%)		
	Middle school and above	69	15(17.9%)		
Occupation	Management	37	5(11.9%)	13.68	0.00
	Worker	43	14(24.6%)		
	Farmer	71	49(40.8%)		
Place of residence	Urban residents	64	16(20.0%)	7.19	0.01
	Rural residents	87	52(37.4%)		

2.1.3 The relationship between MCI and lifestyle factors

The smoking had no effect on the incidence of MCI (Table 2, $P > 0.05$); Drinking had no effect on the incidence of MCI (Table 3, all $P > 0.05$); Tea had no effect on the incidence of MCI (Table 4, all $P > 0.05$); The exercise influenced the incidence of MCI. The exercise group had the higher incidence of MCI than that of the non-exercise group ($X^2 = 10.24$, $P = 0.00$). But there were no different between the group of exercise frequency < 4 times / week and the group of exercise frequency ≥ 4 times / week in the incidence of

MCI ($X^2 = 1.78$, $P = 0.18$). Exercise ≤ 10 years group and exercise > 10 years group were no difference in the incidence of MCI ($X^2 = 0.28$, $P = 0.87$) (Table 5); The hobby influenced the incidence of MCI, A hobby group had the higher incidence of MCI than that of the non-hobby groups ($X^2 = 10.77$, $P = 0.00$). But the group of hobby history ≤ 10 years and the group of hobby history > 10 years were not different in the incidence of MCI ($X^2 = 1.19$, $P = 0.27$) (Table 6). Lunch break had no effect on the incidence of MCI (Table 7).

Table 2 The influence of smoking to the incidence of MCI

Lifestyle factors	NC	MCI(%)	X ²	P
0 group	102	54(34.6%)	3.22	0.07
1 group	49	14(22.2%)		
2 group	21	7(25.0%)		
3 group	28	7(20.0%)	0.23	0.64
4 group	18	7(28.0%)		
5 group	31	7(18.4%)		

Note :Group Code: 0 group for non-smoking;1 group for smoking; 2 group for smoking group <20 cigarettes / day;
3 group for smoking ≥ 20 cigarettes / day; 4 group for smoking history<40 years; 3 group for smoking history≥ 40 years.

Table 3 The influence of drinking to the incidence of MCI

Lifestyle factors	NC	MCI(%)	X ²	P
0 group	101	47(31.8%)	0.11	0.74
1 group	50	21(29.6%)		
2 group	31	10(24.0%)		
3 group	19	11(36.7%)	1.25	0.26
4 group	16	8(33.3%)		
5 group	34	13(27.7%)		

Note: Group Code: 0 group for non- drinking ;1 group for drinking group; 2 group for drinking≤ 100ml/ day;
3 group for drinking> 100ml/day;4. group for drinking history≤20 years;5. group for drinking history> 20 years.

Table 4 The influence of drinking tea to the incidence of MCI

Lifestyle factors	NC	MCI(%)	X ²	P
0 group	58	34(37.0%)	2.59	0.11
1 group	93	34(26.8%)		
2 group	17	10(37.0%)		
3 group	76	24(24.0%)	1.84	0.18
4 group	47	19(28.8%)		
5 group	46	15(24.6%)		

Note: Group Code:0 group for non- drinking tea ;1 group for drinking tea ; 2 group for drinking tea <4 times / week,
3 group for drinking tea≥4 times / week. 4 group for drinking tea history<30 years,5 group for drinking tea history≥30 years.

Table 5 The influence of exercise to the incidence of MCI

Lifestyle factors	NC	MCI(%)	X ²	P
0 group	56	41(42.3%)	10.24	0.00
1 group	95	27(22.1%)		
2 group	26	11(29.7%)		
3 group	69	16(18.8%)	1.78	0.18
4 group	37	11(22.9%)		
5 group	58	16(21.6%)		

Note: Group Code:0 group for non-exercise ; 1 group for exercise;2 group for exercise frequency<4 times / week, 3 group for exercise frequency≥ 4 times / week; 4 group for exercise history ≤ 10 years , 5 group for exercise history > 10 years.

Table 6 The influence of hobby to the incidence of MCI

Lifestyle factors	NC	MCI(%)	X ²	P
0 group	51	39(43.3%)	10.77	0.00
1 group	100	29(22.5%)		
2 group	37	14(27.5%)	1.19	0.27
3 group	63	15(19.2%)		

Note: Group Code: 0group for non- hobby ; 1 group for hobby; 2 group for hobby history ≤ 10 years , 3 group for hobby history > 10 years.

Table 7 The influence of lunch break to the incidence of MCI

Lifestyle factors	NC	MCI(%)	X ²	P
0 group	56	31(35.6%)	1.42	0.23
1 group	95	37(28.0%)		
2 group	31	18(36.7%)	2.92	0.09
3 group	64	19(22.9%)		
4 group	64	37(36.6%)	2.73	0.10
5 group	87	31(26.3%)		

Note: Group Code:0 group for non- lunch break ; 1 group for lunch break; 2 group for lunch break frequency≤4 times / week, 3 group for lunch break frequency> 4times / week. 4group for sleep hours per night ≤ 6 hours, 5 group for sleep hours per night >6 hours.

3 Discussion

In recent years, the effect of elderly living factors on cognitive impairment attracted more and more attention. This study found that female was the risk factor of MCI, and similar to previous studies, Huo DH investigated the cognitive function and influencing factors for 488 elderly people and found that female was lower than the male in the MMSE score [5]. The female had higher incidence of dysfunction than that of the male. Smith J investigated 258 male and 258 female all aged >70 years, found that the female was lower than the male in the MMMSE score[6]. This study found that ages had no effect on cognitive function. Liu JL did risk factors. regression analysis of dementia and cognitive impairment and obtained the same conclusion. The difference may be related to different sample size and statistical methods [4]. Tervo S found that lower- education level was risk factors of MCI [7]. The cases whose educational level was lower were more likely to develop MCI than those who had higher educated. This study found that with the increasing of the education level, the incidence of MCI significantly decreased (50.8% for illiterate, 29.7%for primary, 17.7% for middle school and above). And it found that lower-education level was one of the risks of MCI (OR = 2.01, 95% CI: 1.36 ~ 2.96).Urban residents were more likely to develop MCI than rural residents.Because the average educational level of rural residents was lower than that of urban residents. Mainly engaged in the mental labor whose cognitive function was higher than the non-mental labor. Jorm AF found that the cognitive score of manual workers engaged in the service industry, etc was lower than mental workers

engaged in the research, artistic etc [8]. The incidence of dysfunction was higher too. The result of the study was similar to it. Farmers were more likely to develop MCI than the workers and managements. People mainly engaged in the manual labor (such as farmers) who were more likely to develop MCI than the people engaged in mental labor (such as managers).The farmer was one of the risk factors of MCI. Occupational differences of cognitive function may be related to the different requirements and impacts of long-term occupation to the intellectual activity. Farmers, engaged in manual labor, who may be less need to stimulate the brain and neural activity than the managers. Smoking and non-smoking on the impact of MCI was not statistically significant. Currently the findings on the smoking effect on cognitive function in domestic and international research were disputed [4]. MA F considered that smoking was a suspicious risk factor for the occurrence of MCI [9]. Meyer held the idea that smoking can accelerate hypoperfusion, ischemic brain mass, which was one of the risk factors for MCI. However [10], some studies found that smoking for the cognitive abilities of Alzheimer's disease had a protective effect, Maybe it had something to do with the antioxidant effects of nicotine ,increasing the levels of fibroblast growth factor in the brain, reducing neurotoxic effects [11]. Different drinking in the incidence of MCI had not Statistically significant. Some people thought that drinking on the cognitive impairment was not a risk factor, nor protective factor [12,13]. However, Tang HD suggested that drinking may be one of the factors preventing Alzheimer's disease [14]. Moderate drinking may improve blood circulation and prevent oxidative damage, protect the cognitive abilities in the brain [15]. However, excessive drinking

was a risk factor for cognitive decline^[16]. The reports from effects of the tea on cognitive function were few. This study suggested that tea had no effect on the incidence of MCI. Liu JL thought that the tea had some effect on the prevention of Alzheimer's disease^[17]. Kuriyama S found that those who drank green tea was less cognitive impairment, The more average consumption of green tea weekly was the less cognitive impairment^[18]. The reason maybe related to the ability of green tea antioxidant^[19].

This study found that the sports and hobbies make the risk of MCI reduced. The sport or hobby group was lower than non-exercise or non-hobby group in the incidence of MCI. It was as basically same as the founding of Christensen H^[20]. If daily activities of elderly people were less, a variety of information received was less and the necessary stimulation maintained normal function of the brain was corresponding reducing, so cognitive ability declined gradually; On the contrary, the increasing of exercise or hobbies could delay and prevent the risk of cognitive impairment^[21]. The better cognitive function in elderly cases was, the better the abilities of activities in daily living were, vice versa^[22]. There were few reports on the influence of lunch break on cognitive function. This study found that lunch break had no effect on delaying the occurrence of cognitive impairment. The research subjects were people who were sleeping per night for 2 hours to 16 hours. The people with insomnia and more sleep had no effect on the incidence of MCI. Fole^[23], et al, 3years old longitudinal study of 71-year-old people, after adjusting for age and other factors, found that there was no association between the insomnia and the incidence of cognitive decline or the dementia. Which was similar to the result of this study.

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老年轻度认知障碍患者生活高危因素探讨*

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摘要 目的：探讨生活高危因素对老年轻度认知障碍的影响。方法：应用简明精神状态量表 (MMSE)、蒙特利尔认知测验量表 (MoCA)、临床痴呆评定量表(CDR)和生活高危因素量表对 219 例老年人进行调查,分析生活高危因素对老年轻度认知障碍的影响。结果：女性患 MCI 风险高于男性($P=0.03$)；文盲组患 MCI 风险高于小学组,小学组高于初中及以上组($P=0.00$)；农民组患 MCI 风险高于工人组,工人组高于管理人员组($P=0.01$)；农村居民患 MCI 风险高于城市居民($P=0.01$)；运动影响 MCI 发病,不运动组患 MCI 风险高于运动组($P=0.00$)；运动频率 <4 次/周高于运动频率 ≥ 4 次/周($P=0.00$)；运动年数 ≤ 10 年组高于运动 >10 年组($P=0.01$)；业余爱好影响 MCI 发病,无业余爱好组患 MCI 风险高于有业余爱好组($P=0.00$)；业余爱好史 ≤ 10 年组高于业余爱好史 >10 组($P=0.00$)。不同年龄的老年人其 MCI 发病风险无统计学差异($P>0.05$)；吸烟、饮酒、喝茶等不同年数及频率的老年人其 MCI 发病风险无统计学差异($P>0.05$)；是否午休及不同午休频率和不同每晚睡眠时间的老年人其 MCI 发病风险无统计学差异($P>0.05$)。结论：性别、教育程度、职业、居住地、运动时间及频率、业余爱好时间等因素与老年 MCI 发病有关。

关键词 轻度认知障碍(MCI) 老年 生活因素

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