

소방공무원의 직무관련질환과 건강실태 조사

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Work related diseases in Korean fire fighters

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요약 이 연구의 목적은 소방공무원의 직무관련성 질환에 대하여 조사하고 소방공무원의 건강관리와 질환 예방대책 마련에 필요한 기초자료를 제공하는 데 있다. 연구 방법은 1개 소방서에 근무하는 전체 소방공무원을 대상으로 구조화된 설문지를 이용하여 자기기입식 기록으로 설문을 받았다. 연구 결과 소방공무원의 37.7%가 만성질환을 가지고 있었고, 12.3%가 만성요통을 앓고 있었다. 증상 부위별로는 허리 41.5%, 어깨 33.0%, 목 23.6%순이었으며, 이로 인해 48.1%가 지난 한달 동안 신체적 아픔으로 집이나 직장 일로부터 지장을 받았다고 답하였다. 또한 54.1%에서 지난 1년 이내에 병원 치료를 받은 것으로 조사되었다. 이상의 결론 도출을 통하여 소방공무원의 특수건강 진단에 근골격계 질환과 관련된 프로그램의 추가, 근골격계 질환을 예방하기 위한 건강증진 프로그램의 개발, 직무 상 발생하는 급성 장애에 대한 수시건강진단 체계의 도입 마련을 제언하고자 한다.

주제어 : 소방공무원, 만성질환, 근골격계 질환, 요통

Abstract The purpose of this study is to investigate work related diseases in Korean firefighters and to prepare the preventive measure for health management for the firefighters. Structured self-reported questionnaire was distributed to the firefighters. The result revealed that 37.7% of fire fighters had chronic diseases and 12.3% had chronic low back pains. The affected parts included lumbar region(41.5%), shoulder(33.0%), and neck(23.6%). The affected parts caused physical pain and work discomfort for more than a month. A total of 54.1% firefighters visited to the hospital within a year. This results suggest that it is necessary to develop the health promotion program for the prevention of musculoskeletal disease and regular health checkup for the acute disorders caused by workload.

Key Words : Chronic disease, Firefighter, Low back pain, Musculoskeletal disease

1. Introduction

Concentration of population and urbanization have continuously increased accidents due to hazardous

materials and man made disaster. Acute and chronic diseases outbreak also accelerate the specialization and diversification of fire and rescue services. As the expectation for the fire and rescue services of people

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increases, but the working condition of firefighters does not improve and keep pacing with the scope of services.

Firefighters are always exposed to psychological, physical, and chemical hazards during their duties of fire suppression and rescue operation. The firefighters are exposed to physical stress including chemicals, combustion heat, infrared rays, and noise, mental stress, and biological stress including bacterial and viral infections. Shiftwork may also have a serious impact on psychological and physical illness. As a result, psychological and physical stresses render the firefighters to be sickened by physical and mental illness. Astrand et al. reported that firefighters during fire suppression duty received much higher intensity of workload than those who treated hazard materials of 2 shiftwork [1]. The typical diseases in fire fighters are cancer, respiratory diseases, reproductive diseases, musculoskeletal diseases, low back pain and so on [2-6].

Won revealed that 1,782 firefighters suffered from business disaster including 62 deaths in the line of duty which accounted for 1.5 times of public service personnel and 1,720 wounds on duty which accounted for 3.7 times of the public service personnel [7]. There are several reports on occupational diseases of firefighters including cerebrovascular diseases [8], posttraumatic stress disorder [9-10], work related health management [11], and low back pain [12], but there seems to be rare reports on chronic diseases and musculoskeletal diseases in firefighters.

Health management in firefighters is very important because it is also related to life-saving activity. The appropriate evaluation of health management in firefighters is overlooked, so it is necessary to establish the right evaluation system in health management of firefighters. The purpose of this study is investigate and analyze the work related diseases and to prepare the preventive measure for firefighters.

2. Methods

2.1 Study design

This study is a descriptive study in health status of firefighters.

2.2 Study subject and data collection

Study subjects were 195 firefighters in J city. From March 15 to April 1 in 2013, structured self-reported questionnaires were collected after informed consents from the firefighters. Structured questionnaires were evaluated and revised by two professors in department of fire service and one professor in department of preventive medicine. A total of 106 sheets were analyzed except 88 incomplete answers.

2.3 Study instrument and statistical method

The questionnaire consisted of 36 questions including 15 questions of general characteristics, 10 questions of past medical history, and 11 questions of physical and musculoskeletal symptoms. Eight questions of past medical history had 5 points of Likert scale. One point was 'always', and 5 points was 'never'. Cronbach's alpha revealed .957 in this study. Collected data were analyzed by SPSS version 19.0 program.

3. Results

3.1 General characteristics of the subject

Male accounted for 89.6% and the majority of the subjects were 40s (52.8%) and 30s(24.5%). Mean body weight was 69.96kg(±7.42) and mean stature was 172.00cm(±4.64). Majority of the subjects were college or university graduates (73.6%) and married (89.6%). Number of cohabitants was 3.83(±1.08) and living standard accounted for 81.1% in average standard of living. Field service accounted for 78.3% and administrators were 14.2%. Fire sergeant accounted for 51.9%. Average working hours were 61.98(±17.22)

hours, and mean period of service was 172 months(±84.48). <Table 1>

<Table 1> General characteristics of the subject

Variables	N	%
Gender		
Male	95	89.6
Female	11	10.4
Age		
Below 29	8	7.5
30s	26	24.5
40s	56	52.8
Above 50s	16	15.1
Education		
Below high school	2	1.9
High school graduate	24	22.6
College(University) graduate	78	73.6
Master degree	2	1.9
Marital status		
Married	95	89.6
Single	10	9.4
Widowed	1	.9
Subjective economic level		
Very wealthy	1	.9
Wealthy	7	6.6
Average	86	81.1
Poor	12	11.3
Work area		
Office service	22	20.8
Field service	83	78.3
Others	1	.9
Administrator		
Yes	91	85.8
No	15	14.2
Class		
Firefighter	17	16.0
Senior firefighter	14	13.2
Fire sergeant	55	51.9
Fire lieutenant	12	11.3
Fire captain	6	5.7
Assistant fire chief	2	1.9
Body weight(M±SD)		69.96 (±7.42)
Stature(M±SD)		172.00cm (±4.64)
Working hours per week(M±SD)		61.98 hours (±17.22)
Period of services(M±SD)		172 months (±84.48)

3.2 Life habits and Health status

Study Past medical history was shown in Table 2. To the question, "Do you have a regular exercise?",

50.9% answered an irregular exercise and 60.4% did 30 minutes' exercise twice to 4 times per week. Nonsmokers accounted for 34.9% including past smokers and 63.2% answered small amount of drinking alcohol. Approximately 54.7% thought that their health status was average health condition. Comparison to one year ago, 49.1% of the respondents answered the same health status. No physical pain within a month accounted for 36.8% and 48.1% suffered from work difficulty due to physical pain.

<Table 2> Correlation between Life styles and Health status

Variables	N	%(±)
Regular exercise		
No	7	6.6
A little exercise	6	5.7
Irregular exercise	54	50.9
Regular exercise	37	34.9
Regular and heavy exercise	2	1.9
Frequency of 30 minutes exercise		
Never or once a week	28	26.4
2-4 times per week	64	60.4
More than 5 times per week	14	13.2
Smoking		
No	35	33.1
Now quitting	37	34.9
Yes	34	32.1
Drinking		
No	23	21.7
A little	67	63.2
Yes	16	15.1
Present health status		
The best	0	.0
Fairly good	5	4.7
Good	34	32.1
Average	58	54.7
Poor	9	8.5
Comparison to one year ago		
Much better	2	1.9
A little better	6	5.7
Same	52	49.1
A little worse	43	40.6
Much worst	3	2.8
Physical pain within a month		
No	39	36.8
A little pain	36	34.0
Small amount of pain	12	11.3
Average amount of pain	10	9.4
Large amount of pain	8	7.5
Much pain	1	.9
Pain influence on the work?		
No	55	51.9
A little	33	31.1
A small amount	12	11.3
Considerably	4	3.8
Much	2	1.9

3.3 Study subject and data collection

Table 3 showed the chronic diseases in fire fighters. Chronic diseases were found in 37.7% of firefighters. Chronic low back pain and chronic rhinitis accounted for 12.3% and were followed by chronic bowel disease (9.4%), hypertension (5.7%), and diabetes mellitus (4.7%).

〈Table 3〉 Chronic diseases

Variables	N	%(±)
Chronic diseases		
Yes	40	37.7
No	66	62.3
Types of chronic diseases		
Low back pain	13	12.3
Rhinitis	13	12.3
Hypertension	10	9.4
Diabetes	6	5.7
Thyroid disease	5	4.7
Bronchitis or COPD*	4	3.8
Hepatitis	3	2.8
Arthritis	3	2.8
Renal disease	3	2.8

3.4 Musculoskeletal symptoms

Work related pain within a year was shown in Table 4. Pain region included neck (23.6%), shoulder (33.0%), arm-elbow (11.3%), hand-wrist-digits (10.4%), lumbar area (41.5%), and leg-knee-ankle (22.6%). Pain longer than a week included neck (47.7%), shoulder (37.3%), arm-elbow (41.6%), hand-wrist-digits (54.8%), lumbar region-hip (43.1%), and leg-knee (33.2%). Pain due to workload included shoulder (64.7%), arm-elbow

(60.0%), hand-wrist-digits (71.2%), lumbar region-hip (71.8%), and leg-knee (67.3%). Hospital visit within a year included shoulder (48.5%), arm-elbow (50.4%), hand-wrist-digits (51.9%), lumbar region-hip (61.4%), and leg-knee (58.4%).

4. Discussion

Fire service may inevitably cause physical and psychological hazards to firefighters. Health management in firefighters is the most important solution but there is almost little management measure for work related diseases. Fire service is very different from other public service, therefore, it must be treated in systematic measure for safety accident and health management. Government must approach the work related diseases by preventive program for fire service officials.

This study revealed that 37.7% of fire service officials had chronic diseases including chronic low back pain (12.3%) and rhinitis (12.3%). Within a year, 41.5% complained of low back pain. Hong et al. revealed that 76.9% of firefighters in field service complained of low back pain [12]. Cole et al. reported that male workers accounted for 14.5%, and female workers accounted for 12.5% in low back pain [13]. Among Korean manufacturing industrial workers, 19.3% suffered from low back pain [14]. The complaint was more common among firefighters (42%) than

〈Table 4〉 Musculoskeletal symptoms

Variables	%						
	Neck	Shoulder	Arm/ elbow	Hand /wrist/digits	Lumbar/hip	Leg/knee/ ankle	
Pain within a year	Yes	23.5	33.0	11.3	10.4	41.5	22.6
	No	76.4	76.0	88.7	89.6	58.5	77.4
Pain more than a week	Yes	47.7	37.3	41.6	54.8	43.1	33.2
	No	52.3	62.7	58.4	45.2	56.9	66.8
Pain due to work	Yes	64.7	60.0	58.4	71.2	71.8	67.3
	No	35.3	40.0	41.6	28.8	28.2	32.7
Treatment history within a year	Yes	47.7	48.5	50.4	51.9	61.4	58.4
	No	52.3	51.5	49.6	48.1	38.6	41.6

among police officers (33%) in Ontario, Canada. In a logistic regression analysis, back problems were significantly associated with the duration of employment, cigarette smoking, and the number of children. Back pain is a multifactorial problem with significant impact on the working population. This survey has found that parenthood, a risk factor not previously described among men, is associated with self reported back pain. The mechanism presumably involves lifting of children or recreational factors. Fatherhood seems to be a confounder that should be controlled for in studies of occupational causes of back pain. Chronic bowel disease (9.4%) and hypertension (5.7%) are the common chronic diseases.

Various occupational physical stressors have been associated with the prevalence of back pain, but their relationship with first onset low back trouble is uncertain. Psychosocial factors reportedly are important determinants of chronicity. Occupational risk factors for first onset low back trouble were determined from lifetables based on officers with no previous back pain history. Survival time to first onset was affected adversely by wearing fire fighter's body armor. The proportion with persistent (chronic) trouble did not depend on length of exposure since onset, but longer service was associated with recurrent episodes. Chronicity was related to distress and blaming fire service work. Work loss was associated with blaming work and wearing body armor. Changing to lighter duties after development of low back trouble occurred rarely.

This study had the limitation that was done in only one fire station. Therefore, it is necessary to include the large number of fire fighters.

5. Conclusion

Exposure to occupational physical stress seems detrimental; it reduced survival time to first onset of

low back trouble. Recurrence was associated with time since onset, but persistent trouble was not. Sports participation was a risk if occupational hazards were high [16]. This study tried to investigate work related disease and to prepare the measure for the health management and disease prevention.

Through the results, it is very important to establish the diagnostic measure for musculoskeletal diseases and health promotion program for the firefighters. Routine medical checkup for firefighters must be implemented in case of acute disorder related to work service.

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