

Original Article

Review of the Prevalence of Chronic Fatigue Worldwide

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Objectives: To obtain the features of prevalence of chronic fatigue and chronic fatigue syndrome worldwide.

Methods: All research reports for prevalence of chronic fatigue and chronic fatigue syndrome were selected from PubMed, KMBase and KISS database, and the prevalence were analyzed according to the symptoms and countries.

Results: A total of 39 articles from 13 other countries and 4 articles from Korea met the criteria of this study. The prevalence of chronic fatigue and chronic fatigue syndrome was about 10% and 1% respectively. The prevalence for Korean was 17.7% and 1.4% respectively, however the data have a limitation due to the lack of well-designed studies.

Conclusions: This report can provide essential information to build a strategy for development of therapeutics against chronic fatigue and chronic fatigue syndrome using traditional Korean medicine.

Key Words : Chronic fatigue, Idiopathic chronic fatigue, chronic fatigue syndrome, prevalence, Korean medicine

Introduction

Fatigue is one of the most prevalent symptoms in modern society. This subjective illness generally disappears after taking rest or treating causative diseases, but uncontrolled chronic fatigue raises a variety of problems in physical and social activities¹⁾. One report from the United States presented that untreated chronic fatigue syndrome reduced the work-force productivity by 54% of afflicted individuals leading to 9.1 billion dollars of total productivity loss in the US²⁾. The characteristic of chronic fatigue is not peripheral fatigue such as decreased muscular power or endurance but central fatigue including memory loss, difficulty of concentration or decline of desire, which impairs physical well-being, psychological and social aspect, and leads to social

isolation³⁾.

In particular, idiopathic chronic fatigue (ICF) or chronic fatigue syndrome (CFS), medically unexplained fatigue lasting over 6 months, doesn't have defined pathophysiology or standard treatment⁴⁾. Thus many patients with chronic fatigue frequently chose the therapeutics of complementary and alternative medicines⁵⁾. Koreans traditionally have used traditional Korean medicine (KM) for cases of chronic fatigue. This would result from the strong points of KM which attaches great importance to subjective symptoms in diagnosis and treatment of diseases^{6,7)}. Accordingly, a KM-based national strategy is needed to strengthen the medical competitiveness for chronic fatigue-associated disorders, however there is a lack of systematic research and developments in Korea⁸⁾.

It is known that the population complaining of

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fatigue is increasing due to the rapid urbanization and severe stress in competitive society. There are large differences in prevalence of chronic fatigue according to the countries or study population⁹⁻¹². The Korean Health Insurance Review Agency reported the number of visiting days and medical expenses increased by 12.4% and 46.5% in 2008 compared with 2003¹³. Nevertheless, no data for the accurate prevalence of chronic fatigue for the general population exist because of lack of studies.

This study aimed to review the prevalence of chronic fatigue and CFS in countries worldwide. This data will be essential information helpful for the further studies focusing on the characterization of chronic fatigue in Korea and development of KM-derived therapeutics.

Methods

1. Study design

In order to compare the features of prevalence of chronic fatigue and chronic fatigue syndrome worldwide, all research reports from countries including Korea were reviewed and analyzed.

2. Data collection

All papers published by February 2012 were collected from the medical databases Pubmed (<http://www.ncbi.nlm.nih.gov/PubMed>) in the USA and Kibase (<http://kibase.medic.or.kr>) and KISS (<http://kiss.kstudy.com/>) in Korea. Papers were screened using the following inclusion criteria: (a) clinical study, (b) question for prevalence, (c) subjects are general population, and (d) targets for chronic fatigue or CFS. The initial assessment using the inclusion criteria was made by reading abstracts. Articles that appeared to meet the criteria were then read in full.

3. Data synthesis and analysis

Total 47 and 12 papers, respectively, from Pubmed, and Kibase or KISS were reviewed. 39 and 4 papers were finally selected because only they focused on the prevalence among the general population. The data considering prevalence were extracted, and were compared according to the country and character of the subjects. Due to the limited character of the data, statistical analysis was not conducted.

Results

1. General characteristics of papers finally selected

A total of 39 papers conducted from 13 countries met the inclusion criteria of this study. Twenty-one studies were produced in the UK and USA while the rest were done in the Netherlands(4 papers), China(3), Brazil(2), Japan(2) and other countries(7). Thirty-three papers focused on the prevalence among the completely general population while 6 papers were for adolescents or soldiers participating in the Gulf War. Seven papers measured the prevalence of both chronic fatigue and CFS while 9 and 23 papers respectively presented the prevalence of chronic fatigue or CFS. In Korea, all four papers were for both chronic fatigue and CFS among subjects who visited clinics or took medical examination.

2. Prevalence of chronic fatigue and CFS in general population

There was a wide range of prevalence of chronic fatigue according to the countries and investigators. One study showed the lowest prevalence as 4.17% in the USA¹⁰ while another reported the highest prevalence as 30.5% in the Netherlands¹⁴. The average prevalence of chronic fatigue in the UK and USA were 11.1% and 10.4% respectively. The total

average of prevalence for chronic fatigue from 13 papers was 11.1%(Table 1).

The prevalence of CFS was very wide from 0.0004% in Australia to 3.6% in the USA^{15,16}. The average prevalences of CFS in the UK and USA were 1.1% and 1.0% respectively, and the total average of prevalence for CFS from 24 papers was 1.2%(Table 1). In particular, the CFS prevalence in

women was higher by 3–4 fold than that of men^{17, 18}.

3. Prevalence of chronic fatigue and CFS in specific groups

There were four papers focused on adolescents. In the UK, the prevalence for chronic fatigue and CFS in adolescents was 1.82% and 0.9%^{44,45} while another study showed 0.11% of CFS in the Netherlands⁴⁶.

Table 1. Prevalence of Chronic Fatigue among General Population Worldwide

Country	Author (year)	Number of subject	Prevalence (%)	
			Chronic fatigue	CFS, CFS-like(male/female)
UK	Nacul LC ¹⁷ (2011)	143,000		0.19 (0.09/0.3)
	Goodwin L ¹⁹ (2011)	11,419		1.0
	Bhui KS ²⁰ (2011)	4,281 (White vs.Pakistani)		0.8 vs.3.5
	Watanabe N ⁹ (2008)	12,792	15	
	Skapinakis P ²¹ (2003)	10,108	9	
	Skapinakis P ²² (2000)	8,026	9	
	Wessely S ²³ (1997)	2,376	11.3	0.5
	Lawrie SM ²⁴ (1995)	1,000		0.56
USA	Reeves WC ²⁵ (2007)	5,623		2.54
	Reyes M ¹⁸ (2003)	7,162		0.1 vs.0.4
	Jason LA ²⁶ (1999)	28,673		0.42
	Jason LA ¹⁰ (1999)	28,673	4.17	
	Ward MH ²⁷ (1996)	425		2.4
	Jason LA ²⁸ (1995)	1,013		0.2
	Buchwald D ²⁹ (1995)	3,066	19	2
	Bates DW ³⁰ (1993)	995	8.5	0.3
Netherlands	van't Leven M ¹⁴ (2010)	9,062	30.5	1
	Huibers MJ ¹⁶ (2004)	5,499		3.6
	Versluis RG ³¹ (1997)	2,3000		0.11
	Bazelmans E ³² (1997)	4,027		0.11
China	Wong WS ¹¹ (2010)	5,001(HongKong)	10.7	
	Yiu YM ³³ (2005)	1,013	6.4	
	Lee S ³⁴ (2000)	100		3
Japan	Hamaguchi M ³⁵ (2011)	1,430		1
	Kawakami N ³⁶ (1998)	207		1.5
Brazil	Cho HJ ³⁷ (2009)	3,914		1.6
Norway	Vistad I ³⁸ (2007)	967	13	
Germany	Martin A ³⁹ (2007)	2,412	6.1	
India	Patel V ⁴⁰ (2005)	2,494 (Woman)	12.1	
Sweden	Evengard B ⁴¹ (2005)	31,405		2.36
Iceland	Lindal E ⁴² (2002)	2,520		1.4
Israel	Buskila D ⁴³ (2001)	28,673		0.42
Australia	Lloyd AR ¹⁵ (1990)	114,000		0.0004

Three reports targeted soldiers who participated in the Gulf War. One American study showed 5.1% and 2.1% of chronic fatigue and CFS respectively⁴⁷⁾, and one British study presented 2.2% of CFS⁴⁸⁾. Another study showed a very high prevalence of CFS by 15.7%, although this was conducted using only questionnaire⁴⁹⁾(Table 2).

4. Prevalence of chronic fatigue and CFS in Korea

There were three studies that questioned for the prevalence of chronic fatigue or CFS in Korea. Two studies were done on subjects visiting the department of family medicine, and then the average prevalence of chronic fatigue or CFS was 9.9% and 0.9%^{50,51)}. Meanwhile, other two were conducted on subjects who visited hospitals for medical examination, and the average prevalence of chronic fatigue or CFS was 25.6% and 2%^{52,53)}(Table 3).

Discussion and conclusion

To identify the prevalence of chronic fatigue is critically essential and important in the process of chronic fatigue-targeting studies and therapeutic developments. This study aimed to review the current studies for the prevalence of chronic fatigue and CFS worldwide.

Since the first survey study was published at 1993 in the USA³⁰⁾, 54% of total studies have been

conducted in two countries, the US and the UK. This might indicate that these advanced countries more early realized the importance of the chronic fatigue-associated medical problems. Seven of 10 papers were published before 2000 in the US while 8 of 11 papers were reported after 2000 in the UK. 14 of the remaining 18 papers from other countries were also published after 2000, which means there is currently active and vibrant research on chronic fatigue worldwide.

According to criteria by Centers for Disease Control and Prevention(CDC) USA in 1994, chronic fatigue was defined as a symptom lasting over 6 months⁵⁴⁾. Among chronic fatigue, medically unexplained fatigue likely ICF and CFS is important in clinic⁵⁵⁾. Most published papers didn't distinguished between ICF and chronic fatigue, and the prevalence was from 4.17% to 30.5%^{10,14)}. There were gaps between countries; however total average prevalence of chronic fatigue was 11.1%. This result indicates that 10% of the general population is suffering from chronic fatigue worldwide. The prevalence among adolescents may be much lower, at only 1.82%^{44,45)}.

On the other hand, CFS is the most severe case of chronic fatigue, and there is no specific biomarker and critical factor for its diagnosis or pathogenesis⁵⁶⁾. The average prevalence of CFS was 1.2% worldwide while the most recent study(2011 year) using 143,000 subjects in the UK reported 0.19%, being 0.3% for women and 0.09% for men¹⁷⁾. In general, it

Table 2. Prevalence of Chronic Fatigue among Specific Populations Worldwide

Country	Author(year)	Subject and its Number	Prevalence (%)	
			Chronic fatigue	CFS
UK	Rimes KA ⁴⁴⁾ (2007)	Adolescent (842)	1.1	0.5
	Farmer A ⁴⁵⁾ (2004)	Adolescent (1,468)	2.34	1.29
	Reid S ⁴⁸⁾ (2001)	Gulf War veterans (3,531)		2.1
USA	McCauley LA ⁴⁷⁾ (2002)	Gulf War veterans (799)	5.1	2.2
	Kipen HM ⁴⁹⁾ (1999)	Gulf War veterans (1,161)		15.7
Netherlands	Nijhof SL ⁴⁶⁾ (2011)	Adolescent		0.11

Table 3. Main Reports for the Prevalence of Chronic Fatigue in Korea

Author (Year)	Subjects (Number)	Prevalence(%)	
		chronic fatigue	CFS
Kim CH (2005) ⁵⁰	Visitors primary care clinics (1,648)	8.4	0.6
Kim CH (2000) ⁵¹	Visitors primary care clinics (988)	11.4	1.2
Ji JD (2000) ⁵²	Hospital visitors for medical check (1,526)	29.4	2
Choi SJ (1999) ⁵³	Hospital visitors for medical check (416)	21.7	1.9

was known that the prevalence of CFS is variable according to sex, age, ethnicity and social environment. Women show a higher prevalence of CFS, about 3-fold that of men⁵⁶. One UK survey showed 4-folds higher prevalence in Pakistani(3.5%) than white (0.8%)²⁰. The average prevalence for adolescents from three papers was 0.6% compared with 1.2% for adults⁴⁴⁻⁴⁶. In contrast, soldiers who participated in the Gulf war had a very high prevalence of CFS, from 2.1% to 15.7%. This is in accordance with the previous finding that psychological stress is a causative factor of CFS⁵⁸.

There was no survey study for the prevalence of chronic fatigue and CFS among a completely general population in Korea, however four studies were done using subjects who visited clinics or took medical examination. The average prevalence of chronic fatigue and CFS was 17.7% and 1.4% respectively which are higher than foreign studies. This might mean the high prevalence among Korean in real; however it might be due to a condition related to subjects' reason for visiting clinics. Accordingly, there is a strong need for the investigation of prevalence among the general population in Korea.

The present study showed the overall features of prevalence for the chronic fatigue and CFS in the general population. The big differences in prevalence of chronic fatigue appeared depending on the countries or subjects studied. The accurate prevalence of chronic fatigue is not fully clarified to date, but about 10% of the population may complain of chronic fatigue and 1% of the general population

may suffer from CFS worldwide.

The high prevalence of chronic fatigue provides Korean medicine a potential treatment for these disorders. This study would be helpful information for development of Korean medicine targeting chronic fatigue-related diseases in the future.

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