

CLINICAL REPORT

Prevalence and Clinical Profile of Vitiligo in China: A Community-based Study in Six Cities

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Vitiligo is a common skin disease, the prevalence of which varies between races and countries. In China, no population-based study has been reported, although there have been some epidemiological studies on single cities or regions. The objective of this study was to obtain the prevalence and clinical profile of vitiligo in China. The study was conducted in 6 cities. Cluster sampling was used in selecting communities. Residents were visited at home and were asked to complete questionnaires and receive dermatological examinations. A total of 19,974 residents were visited and 17,345 valid questionnaires were obtained. The overall prevalence of vitiligo was 0.56%. Men were affected more than women (0.71% vs. 0.45%, $p < 0.01$). The prevalence of vitiligo increased with age. The most common type was focal vitiligo (36.1%). A positive family history was found in 9.8% of patients. Thirty-two percent of patients reported a negative impact of vitiligo on their quality of life. Key words: vitiligo; China; community-based study; prevalence.

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Vitiligo is an acquired skin disorder characterized by depigmentation of the skin which affects all races and both genders (1). Although the aetiology of vitiligo is unknown, mounting evidence suggests that genetic and environmental factors are involved in its pathogenesis (2).

Epidemiological studies have been performed in several countries and regions, and the prevalence of vitiligo varied from study to study. The global prevalence of vitiligo ranged from 0.1 to 2.0% (2–5). In Caucasian people, the prevalence of vitiligo was approximately 1% (2). However, studies in some European and Asian countries suggested that the prevalence of vitiligo might have been overestimated (3, 4). Because some studies were performed in hospital-based populations, it is possible that prevalence could be overestimated (6–8). To

prevent overestimation, a large-scale population-based study is necessary.

In China, several studies had been performed over the past years and the prevalence of vitiligo ranged from 0.09% to 0.31% (9–12). These studies were all conducted in a single region or single city. So far, there has been no multi-centre population-based study. We performed a population-based study involving 6 cities in different regions of China. The results show that the prevalence of vitiligo in China is 0.56% and men are affected more often than women.

METHODS

Six cities were chosen for this community-based study. Each city was from a different province: Taiyuan city, Langfang city in north China, Hailar city in northeast China, Zibo in east China, Xichang in southwest China, and Jiaozuo in central China. The cluster sampling method was used to select communities. Cluster sampling is usually located in a geographic area or administrative vicinity so that all units of a chosen cluster can be studied with minimal costs. Cluster sampling is often used for nation-wide interview studies of households or factories, where people or factories are often widely distributed (13). In each city, 3–5 communities were selected. Informed consent was obtained from all residents. Residents were asked to complete questionnaires and undergo dermatological examination. The study was carried out by investigators including dermatologists from Peking University People's Hospital and dermatologists from local hospitals. They were all trained for the investigation and were required to pass an examination for qualification. Vitiligo was classified into 5 clinical types, as reported previously (14), including focal vitiligo, generalized vitiligo, universal vitiligo, acrofacial vitiligo and segmental vitiligo. Age- and gender-adjusted prevalence of vitiligo was calculated based on the China Population Composition in 2003. Data were analysed using the EpiData software and Statistical Package for Social Sciences, version 13.0 (SPSS Inc., Chicago, IL, USA). Statistical significance was analysed using χ^2 . $p < 0.05$ was considered statistically significant. A 95% confidence interval (95% CI) was analysed by Stata Data Analysis and Statistical Software.

RESULTS

Prevalence of vitiligo

A total of 19,974 people were visited and 17,345 valid questionnaires were obtained (7,858 males and 9,487 females). Vitiligo was present in 122 people (0.7%,

Table I. Prevalence of vitiligo in different age groups

	Age, years								Total
	0–9	10–19	20–29	30–39	40–49	50–59	60–69	≥70	
Total, <i>n</i>	1,009	1,658	2,697	2,664	2,622	2,626	2,116	1,953	17,345
Vitiligo, <i>n</i> (%)	1 (0.10)	6 (0.36)	6 (0.24)	15 (0.56)	19 (0.72)	17 (0.65)	24 (1.13)	34 (1.74)	122 (0.70 ^a)
95% CI	0.01–0.46	0.15–0.74	0.01–0.46	0.33–0.90	0.45–1.11	0.39–1.01	0.75–1.65	1.23–2.39	0.59–0.84
Men									
Total, <i>n</i>	522	884	1,446	1,128	1,077	1,030	829	942	7,858
Vitiligo, <i>n</i> (%)	0 (0)	2 (0.23)	5 (0.35)	7 (0.62)	10 (0.93)	10 (0.97)	15 (1.81)	26 (2.76)	75 (0.95 ^b)
95% CI	0.00–0.48	0.05–0.72	0.13–0.76	0.28–1.21	0.48–1.64	0.50–1.72	1.06–2.89	1.85–3.96	0.76–1.19
Women									
Total, <i>n</i>	487	774	1,251	1,536	1,545	1,596	1,287	1,011	9,487
Vitiligo, <i>n</i> (%)	1 (0.21)	4 (0.52)	1 (0.08)	8 (0.52)	9 (0.58)	7 (0.44)	9 (0.70)	8 (0.79)	47 (0.50 ^c)
95% CI	0.02–0.96	0.17–1.22	0.01–0.37	0.25–0.98	0.29–1.06	0.20–0.86	0.35–1.27	0.37–1.49	0.37–0.65

Standardized prevalence: ^a0.56%, ^b0.71%, ^c0.45%.

CI: confidence interval.

95% CI 0.59–0.84%). After standardization, the prevalence was 0.56%. Moreover, the prevalence of vitiligo increased with age. In the 0–9 years age-group, the prevalence was 0.10% (95% CI 0.01–0.46%), while it increased gradually to the highest prevalence of 1.74% (95% CI 1.2–2.4%) in the ≥70 years age-group (Table I).

In men, the prevalence of vitiligo was 0.95% (95% CI 0.76–1.19%), 0.71% after standardization. Prevalence in men also increased with age. The lowest prevalence (0.23%, 95% CI 0.05–0.72%) was found in the 10–19 years age-group and the highest prevalence (2.76%, 95% CI 1.85–3.96%) was found in the ≥70 years age-group. In women, the prevalence was 0.50% (95% CI 0.37–0.65%), 0.45% after standardization. The prevalence of vitiligo in women was significantly lower than that in men ($p < 0.01$) (Table I).

The prevalence of vitiligo varied from city to city. The highest prevalence was found in Taiyuan (0.93%, 95% CI 0.62–1.35%), followed by Jiaozuo (0.81%, 95% CI 0.52–1.20%), Zibo (0.70%, 95% CI 0.45–1.05%), Hailar (0.62%, 95% CI 0.37–0.98%) and Langfang (0.61%, 95% CI 0.39–0.91%). The lowest prevalence was found in Xichang (0.58%, 95% CI 0.35–0.92%). However, these differences were not significant ($p > 0.05$). In men, the highest prevalence was found in Taiyuan (1.53%, 95% CI 0.96–2.33%), followed by Zibo (1.04%, 95% CI 0.56–1.80%), Jiaozuo (0.94%, 95% CI 0.51–1.58%), Hailar (0.88%, 95% CI 0.45–1.55%), Langfang (0.85%, 95% CI 0.50–1.33%), and Xichang (0.56%, 95% CI 0.25–1.09%). In women, the highest prevalence was found in Jiaozuo (0.69%, 95% CI 0.36–1.22%), followed by Xichang (0.60%, 95% CI 0.30–1.09%), Zibo (0.51%, 95% CI 0.26–0.91%), Taiyuan (0.42%, 95% CI 0.17–0.86%), Hailar (0.41%, 95% CI 0.17–0.85%), and Langfang (0.35%, 95% CI 0.15–0.72%). The prevalence of vitiligo in men was higher than in women in the 5 cities ($p < 0.01$). However, in Xichang, the prevalence of vitiligo in women (0.60%) was higher than in men (0.56%) ($p > 0.05$) (Table SI; available from <http://www.medicaljournals.se/acta/content/?doi=10.2340/00015555-1397>).

Types of vitiligo

Among 122 patients, 44 (36.1%) had focal vitiligo and 43 (35.3%) had generalized vitiligo. Universal vitiligo was found in 22 patients (18.0%) and acrofacial vitiligo was found in 10 patients (8.2%). Only 3 patients (2.5%) showed segmental vitiligo. The types of vitiligo were similar between men and women (Table II).

Age of onset

The onset age of vitiligo varied significantly, ranging from 5 to 79 years (median age 37.6 ± 19.4 years). When patients were grouped by 10 years, the highest onset age was seen in the 20–29 years age-group (17.6%), followed by 40–49 years (16.8%), 10–19 years (15.1%), 50–59 years, 60–69 years (13.5%) and ≥70 years (4.2%). When onset age was compared between vitiligo subtypes, early onset was found in the focal type (32.1 years) while late onset was predominant in the acrofacial type (48.3 years). The onset age of segmental vitiligo was 41 years (Table II).

Family history

Family history was found in 9.8% of the patients with vitiligo, which was significantly higher than that in the whole study population (1.3%) ($p < 0.01$). Family history in first-degree relatives was 9.0% and in second-degree relatives 2.5%. Familial clustering was much higher (33.3%) in patients with segmental vitiligo. Due to the small number of segmental vitiligo, it was impossible to perform statistical analysis.

Impact on quality of life

Vitiligo was reported to have a negative impact on quality of life (QoL) by 32.0% of patients. Women were more influenced by vitiligo (38.3%) than were men (28.0%, $p > 0.05$). 64.8% of patients had tried medical treatment (62.7% in men, 68.9% in women). Of patients who reported a negative impact on their QoL 87.2%

Table II. Clinical type of vitiligo^a

Type	Total n (%)	Males n (%)	Females n (%)
Focal	44 (36.1)	25 (33.3)	19 (40.4)
Generalized	43 (35.2)	29 (38.7)	14 (29.8)
Universal	22 (18.0)	13 (17.3)	9 (19.2)
Acrofacial	10 (8.2)	8 (10.7)	2 (4.3)
Segmental	3 (2.5)	0 (0)	3 (6.4)
Total	122 (100)	75 (100)	47 (100)

^aFor age and sex distribution see Table SII; available from <http://www.medicaljournals.se/acta/content/?doi=10.2340/00015555-1397>.

sought for treatment, which was significantly higher than those who did not report such negative impact (54.2%, $p < 0.01$).

DISCUSSION

Although vitiligo occurs worldwide, it is known that its prevalence varies between races and regions. Horwitz et al. (3) reported that the prevalence of vitiligo in Denmark was 0.38%. Mehta et al. (15) reported that the prevalence was 0.49% in rural areas of Indian and 1.78% in urban areas. Abdel-Hafez et al. (16) performed a survey in Upper Egypt and found the prevalence of vitiligo to be 1.2%. In the USA, the prevalence was 0.74% (17). Other studies have shown a prevalence of 0.3% in Libya (18), 0.5–1% in the French West Indies (6), and 0.3% in Tanzania (19). All of these studies suggested that prevalence of vitiligo varied between regions and races.

In China, several studies have been performed, with prevalence ranging from 0.1% to 0.3% (9–12). In our community-based study, we selected 6 cities from 6 provinces, which showed that the prevalence of vitiligo in China was 0.56%, which was higher than reported in previous studies (Table SIII; available from <http://www.medicaljournals.se/acta/content/?doi=10.2340/00015555-1397>).

This study showed that the prevalence of vitiligo increased with age; increasing gradually from 0.10% in the 0–9 years age-group up to 1.74% in the ≥ 70 years age-group. These results were similar to 2 previous reports (3, 11). A comparison between this study and that of Lu et al. (11) is shown in Fig. 1. The prevalence of vitiligo in our study was higher in all age groups. The prevalence was higher in people > 50 years of age than those < 50 years of age. The increase in prevalence with age may be related to a cumulative effect, because vitiligo is usually a long-lasting disease and is life-long in most patients.

Our results also demonstrated a higher prevalence of vitiligo in males than in females. The male to female ratio was 1.6:1, which is similar to the result reported by McBurney (20). However, this result is different from that reported by other studies (1, 11, 21), which

showed that males and females were equally affected. In contrast to our results, Boisseau-Garsaud et al. (6) found that women were more affected than men. However, their result is from a hospital-based population, which usually differs from population-based studies. Women are usually more concerned about pigmentation changes of their skin and may be more diligent in seeking treatment. This may be a possible reason for the greater number of female patients in their study (22).

Our study also found that the prevalence of vitiligo varied among regions in China. The highest prevalence was found in Taiyuan (0.9%) and the lowest in Xichang (0.6%). Two previous studies had demonstrated that prevalence of vitiligo was 0.1% in Taian city (9) and 0.2% in Suzhou city (10), suggesting a variation between regions in China. The study population's lifestyle in different regions might contribute to these differences. It is interesting that, in 5 cities, men were affected more than women, while the opposite was seen in Xichang city. In most regions, including these 5 cities, men usually do more outdoor work than women, while in Xichang city women do more outdoor work than men due to local culture.

Our results showed that the median onset age of vitiligo was 37.6 years. Vitiligo developed before the age of 40 years in 45.5% of patients. Also, early onset was found in the focal type of vitiligo (32.1 years), while late onset was found in the acrofacial type (48.3 years). These results were similar to those of Lu et al. (11). Similarly, Handa & Kaur (21) also reported that the peak incidence was in the second or third decade of life. Zhang et al. (23) reported that approximately half of the patients had vitiligo before the age of 20 years. Boisseau-Garsaud et al. (6) also found that the median age of onset was 29 years. In our study, 3 patients with segmental vitiligo had a late age of onset (41 years), which is different from other studies (21, 23). Because this number is small, no conclusions could be drawn.

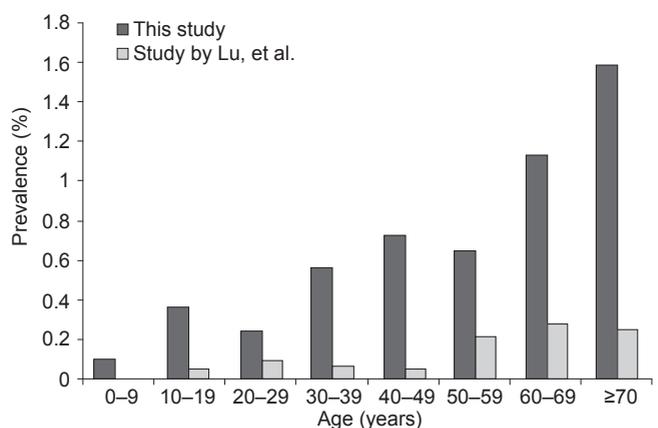


Fig. 1. Comparison of the prevalence of vitiligo in this study with the result of Lu et al. (11). Prevalence of vitiligo in this study was much higher than that of Lu et al. at all age groups. Also, an increase in prevalence with age was prominent in this study.

Several epidemiological studies have suggested that a genetic predisposition might be a risk factor for vitiligo (1, 8, 23). In this study, a positive family history was present in 9.8% of patients with vitiligo, which was lower than some hospital-based studies (1, 24, 25). Positive family history in first-degree relatives was 9.0%, which is higher than previously reported (0.1–2.0%) (26). We also found that segmental vitiligo had much higher percentage of positive family history (33.3%) than non-segmental vitiligo (9.2%), suggesting that segmental vitiligo has a closer relationship with heredity (20).

Vitiligo is a psychologically devastating disorder that causes feelings of embarrassment and self-consciousness in most patients (27–29). Mattoo et al. (28) reported that 25% of patients with vitiligo also had psychiatric disorders. In this study, we found that QoL in females was more influenced by vitiligo than in males. Our finding was similar to that of a previous study (29). This gender discrepancy may be skewed by increased reporting of cosmetic concerns by female patients. We also found that patients whose QoL was more influenced tended to seek more treatments.

To our knowledge, this is the first multi-centre, population-based study in China on the prevalence and clinical profile of vitiligo. However, 6 cities do not constitute a large sample, as China has 31 provinces and more than 600 cities, and this is a limitation of this study.

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The authors declare no conflicts of interest.

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