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Original Article

# Characteristics of human immunodeficiency virus infections among the elderly in Taiwan: A nationwide study

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#### Abstract

*Background*: Information regarding human immunodeficiency virus (HIV) infections and acquired immunodeficiency syndrome (AIDS) in the elderly of Taiwan is limited. This study looked into the aforementioned issues.

Methods: Data from the National HIV/AIDS Registry, relating to individuals diagnosed in 2007, were analyzed.

*Results*: Among 1,975 HIV-infected individuals diagnosed in 2007, the elderly group (age  $\geq$  50 years) consisted of 153 subjects and the younger (control) group (age 15–39 years) consisted of 1,458 individuals. Some markers, such as primarily males/local Taiwanese, being unemployed, one third of subjects infected by means of intravenous drug use, and primarily diagnosed in hospitals, were similar between the two groups. The elderly group had more married, divorced, and separated individuals, and widows/widowers than the younger group. The causes of death differed insignificantly between the two groups. The younger group had more variety than the elderly group in distribution of occupations. Fewer prison-diagnosed HIV, high ratio of individuals developing AIDS, heterosexuals, high mortality, and unsupported marital status were significant markers of elderly HIV-infected subjects.

*Conclusion*: In Taiwan, elderly HIV infections have reflected the aforementioned characteristics. Some specific issues concerning elderly HIV infections, such as heterosexual predominance, high mortality and fewer men who have sex with men, are similar with reports from other countries. These characteristics can guide possible directions of social and health care interventions.

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Keywords: Acquired immunodeficiency syndrome; Epidemiology; Health services for the aged; HIV infections; Taiwan

# 1. Introduction

Human immunodeficiency virus (HIV) infections, including acquired immunodeficiency syndrome (AIDS), have been reported in Taiwan since 1984. The annual incidence of newly diagnosed HIV cases has increased gradually, with the trend increasing since 2003.<sup>1</sup>

With an aging society and advances in anti-HIV regimens, HIV infections in the elderly (age  $\geq$  50 years) are being paid more attention. The major considerations are that HIV infections in the elderly could reflect a delayed diagnosis, an accelerating immunocompromised status, and complicated comorbidities, resulting in limited therapeutic effects in this group.<sup>2,3</sup>

The rapidly rising proportion of the aged population in Taiwan is astonishing. Since 1993, the Taiwanese population has been defined as an aging society according to the World Health Organization.<sup>4</sup> There has been an increase in the number of elderly subjects with HIV infections in Taiwan. In

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1997, 47 local Taiwanese subjects aged  $\geq$  50 years were newly reported as having HIV infections, whereas in 2007, up to 152 cases were newly reported (see Fig. 1).<sup>5</sup> Information regarding HIV infections in the elderly in Taiwan is limited, and the aim of this study was to understand the characteristics of these patients.

# 2. Methods

#### 2.1. Data source

Data from the National HIV/AIDS Registry, concerning subjects with HIV infections who were newly diagnosed and registered in 2007, were reviewed. The National HIV/AIDS Registry was established in 1984 and is maintained by the Taiwan Centers for Disease Control, Department of Health, Executive Yuan, Republic of China. The definition of HIV infections, detection methods, and procedures of reporting and registering, are documented.<sup>1</sup> Demographic data pertaining to subjects, HIV-infecting risk factors, survival status, AIDS-defining diseases, and related death were recorded and analyzed. The definitions of AIDS and AIDS-defining diseases are according to the 1993 American Centers for Disease Control and Prevention revised criteria.<sup>6</sup>

## 2.2. Subjects and parameters

Subjects were categorized into two groups: (i) the elderly group, subjects aged  $\geq 50$  years; (ii) the younger (control)

group, aged 15-39 years. Individuals aged <15 years or 40-49 years of age were excluded from the study to significantly separate the two groups. The subjects' age was calculated by 2007 minus their birth year (AD). Each subject's survival status was recorded until December 16, 2008, when the latest death of subjects occurred. In terms of HIV-infecting risk factors, homosexual exposures were defined as men who had sexual experiences with men (MSM), and bisexual exposures as men who had sexual experiences with both men and women. Heterosexual exposures were defined as men who had sexual experiences with women, and vice versa. In terms of marital status, "separation" was defined as subjects who were married but did not have sex or live together with their spouse. In terms of causes of death, "AIDS-related conditions (ARC)" were defined as chronic symptomatic HIV infections or combined opportunistic infections. "Severe illness, not related to ARC" was defined as those individuals who had developed AIDS but their fatal illnesses were not associated with ARC (such as bacterial pneumonia or sepsis). "Severe illness, not related to HIV infections" was defined as those subjects who did not develop AIDS and whose fatal illnesses were not associated with HIV infections.

## 2.3. Statistical analyses

Data are expressed as mean  $\pm$  standard deviation. SPSS software (SPSS version 17.0; SPSS Inc., Chicago, IL, USA) was used for statistical analyses. The independent *t* test,  $\chi^2$  test, Fisher exact test, and trend  $\chi^2$  test were used to calculate

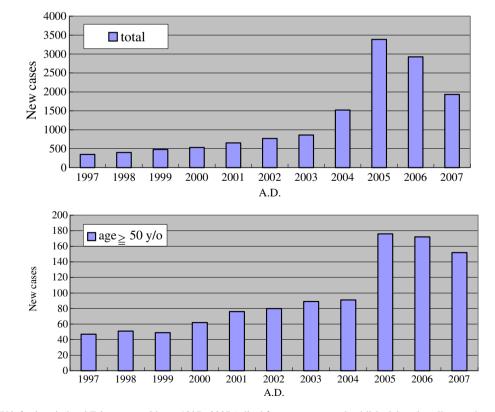


Fig. 1. The trend of HIV infections in local Taiwanese residents, 1997–2007 (edited from governmental published data, http://www.cdc.gov.tw/public/Attachment/932315393071.xls).

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