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A cohort study of chronic diseases for Mongolian people: Outline with baseline data of the Moncohort study

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Abstract Many Mongolian people suffer from non-communicable chronic diseases. In order to plan preventive strategies against such diseases, we designed a community-based prospective cohort study of chronic diseases, called the Moncohort study, in Mongolia. This is the first nationwide large-scale cohort study of chronic diseases. This paper describes the study's rationale, design and methods with baseline data.

Mongolian residents aged ⩾40 years were selected nationwide from many geographic regions in 2009. Data were collected on demographics, socioeconomic status, lifestyle, and anthropometric and biochemical measurements.

In total, 2280 Mongolian residents were registered in the survey. Socioeconomic, lifestyle, anthropometric and biochemical characteristics were differentiated by gender and geographical area in descriptive data. Aging, low social class, physical inactivity and infrequent fruits intake were positively associated with histories of chronic disease in men, while aging was positively associated with histories of chronic disease in women.

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Factors associated with chronic diseases reveal gender-oriented strategies might be needed for their prevention. Detailed prospective analyses will illustrate the impact of risk factors on chronic diseases and lead to evidence for designing programs aimed at preventing chronic diseases and related disorders in Mongolia.

1. Introduction

Mongolia is a landlocked country in east-central Asia (with a relatively high altitude and cold weather in winter). Non-communicable chronic diseases (NCDs), such as cardiovascular disease (CVD), cancer, hepatic diseases, and diabetes mellitus, affect people's quality of life and socioeconomic status (SES); therefore, the prevention of chronic diseases is an urgent need for public health [1,2]. In 2008, 60% of all deaths in the world, resulted from NCDs, and 80% of these deaths occurred in low- and middle-income countries [3,4]. The highest number of deaths occurred in the Western Pacific and South-East Asia regions [5].

Among the regions, with a modernization of whole country, Mongolia has experienced an epidemiological transition of NCDs over the last 20 years. The World Health Statistics reported that an age-standardized mortality rate by NCDs was 966 (per 100,000 population) in 2014 [6] and NCDs were estimated to account for 79% of total deaths in Mongolia [7]. A health burden caused by NCDs, such as CVD and cancer in particular, has increased [6,7]. Of important, CVD has been the leading cause of death in Mongolia [1,8] and the CVD-related morbidity is increasing year by year [8,9]. The Mongolian survey of 2006 revealed that nine in every ten people had at least one risk factor for developing NCDs [10,11]. The life expectancy of Mongolian people compared to those in developed countries is shorter as a result of NCDs. In 2009, the level of Mongolia's life expectancy was 153rd out of 223 countries around the world [8,9]. Thus, building urgent strategies against NCDs is required.

As one of the analytical study designs of epidemiology, a prospective cohort study is considered the best design to determine the impact of risk factors on health outcomes, particularly disease morbidity and mortality [12,13]. There have been many cohort studies for chronic diseases around the world and their results have provided the best evidence for health policy and preventive programs for chronic diseases [14—19].

In order to determine the risk factors for chronic diseases, several surveys have previously been conducted in Mongolia [10,11,20—26]. However, these surveys were not always large-scale, used descriptive and cross-sectional study designs, and data were very limited on risk factors for chronic diseases in Mongolian people. A nationwide population-based cohort study has not yet been conducted in Mongolia. Therefore, we have been conducting the Moncohort study, a nationwide population-based large-scale prospective cohort study, using a representative random sample of Mongolian adults in order to assess the risk factors for chronic diseases. The results of our study will help develop national strategies against chronic diseases in Mongolia. In addition, it will provide data that can easily be compared to studies from other countries. Here, we describe the study's outline with the baseline data. The present paper further analyzed the factors associated with the histories of chronic diseases.

2. Materials and methods

2.1. Study design

First, a baseline survey for determining the risk factors for chronic diseases was conducted by a cross-sectional study design. This study followed the WHO ''STEP wise approach to surveillance of NCDs'' (STEPS) methodology [27]. Next, a prospective cohort study design was used through follow-up periods of 5, 10 and 20 year intervals.

Participants will be followed until death or until dropout from the study. By using the identification (ID) number, the database is regularly linked with the Department of National Statistics of Mongolia, which receives notifications of all cases of CVD, cancer, diabetes mellitus and hepatic diseases. Causes of death will be obtained from the Registry of Death system.

After completion of the cohort study, in order to determine the cumulative incidence of NCDs over the study period, the Kaplan—Meier method will be used to generate the survival function of NCDs mortality. The log-rank test will be used to