



ELSEVIER

Contents lists available at ScienceDirect

Pediatric Neurology

journal homepage: www.elsevier.com/locate/pnu

Original Article

Head Circumference Growth Reference Charts of Children Younger Than 7 Years in Chinese Rural Areas



Shengnan Xie MD^a, Junxin Shi PHD^b, Jianmin Wang MD^a, Neng Li MD^a,
Senbei Yang BS^a, Jing Zhang MD^{a,*}

^a Department of Woman and Child's Care and Adolescence Health, School of Public Health, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, Hubei, China

^b Center for Injury Research and Policy, The Research Institute at Nationwide Children's Hospital, Columbus, Ohio

ABSTRACT

BACKGROUND: The head circumference growth reference charts for children in China are presently based on urban children. However, the references may not apply to rural children because of the differences between urban and rural areas, such as economy, culture, and dietary habits. Our objective was to provide a reliable continuous set of head circumference growth reference charts for male and female children less than 7 years of age in Chinese rural areas. **METHODS:** Children in our study were identified by multistage stratified cluster sampling from rural areas of 10 provinces in China. Questionnaire survey and anthropometric measurements were conducted in data collection. Head circumference was measured with a nonelastic tape on a line passing over the glabella and posterior occipital protrusion in children. We compared the fiftieth percentile of our cross-sectional data with the data of Chinese cities, World Health Organization, and the United States. **RESULTS:** A total of 95,904 children (48,722 boys and 47,182 girls) were included in the study. We present age- and sex-appropriate head circumference growth charts younger than 7 years for Chinese rural areas. The head circumference percentiles of the children in rural China are much smaller than the children in Chinese urban areas, World Health Organization, and the US percentiles after 2 years old. **CONCLUSIONS:** Head circumference percentiles can be applied in growth monitoring, but current head circumference growth references promulgated in urban China may not be suitable for rural areas in China. Providing head circumference growth reference charts for rural Chinese children who are younger than 7 years old is very important.

Keywords: China, rural area, children, head circumference, growth reference chart

Pediatr Neurol 2014; 51: 814-819

© 2014 Elsevier Inc. All rights reserved.

Introduction

Head circumference is one of the most commonly used anthropometric measurements in the assessment of growth, and it is thought to be the simplest and most reliable index of total brain volume. Head circumference is commonly used in clinical practice to screen for

macrocephaly or microcephaly and their various underlying pathologies.^{1,2}

Head circumference correlates with cognitive function,^{3,4} intracranial volume, and brain volume when age and sex are considered.⁵ A study in children has revealed that the brain volume a child achieves by age one year helps determine later intelligence.⁴ Children with larger brain volume, measured with head circumference, tend to score higher on tests of cognitive function. At the same time, it is generally accepted that children with autism spectrum disorders tend to have large heads.⁶ Many medical problems, including various syndromes, may be related to microcephaly and macrocephaly. A study proposed that the women at high risk of breast cancer can be detected macrocephaly, which may be a feature of genetic syndrome

Article History:

Received May 21, 2014; Accepted in final form August 23, 2014

* Communications should be addressed to: Dr. Zhang; Department of Woman and Child's Care and Adolescence Health; School of Public Health; Tongji Medical College; Huazhong University of Science and Technology; 13 Hangkong Road; Wuhan, Hubei 430030, China.

E-mail address: fyejbz@126.com

with a strong predisposition for breast cancer.⁷ In addition, atypical head circumference growth is an indicator of various neurological or neurobehavioral disorders, e.g., hydrocephalus, congenital metabolic disorders, chromosomal abnormalities.^{8,9} A national reference curve for head circumference determines approximately how many children will be included in further investigation. Therefore, head circumference references are essential for clinical evaluations.^{10,11}

Many studies of head circumference in China focus on urban children. And the head circumference growth reference charts for children in China are also based on urban children currently.¹² However, the reference data may not apply to rural children because of the differences between urban and rural areas, such as economy, culture, and diet. The economic development and public health are extremely unbalanced between in China. The income gap of urban and rural residents is gradually expanding.¹³ Therefore, the aim of this study was to provide head circumference percentiles, which were more applicable to rural area's children younger than 7 years. A comparison of these references with internationally used head circumference reference data from Chinese cities,¹² World Health Organization (WHO),¹⁴ and the United States¹⁰ is made to evaluate the magnitude and type of differences that may exist.

Materials and Methods

Patients

The data were from National Children Growth Standard Survey in 2006 (i.e., in Jilin, Shanxi, Gansu, Xinjiang, Jiangsu, Sichuan, Jiangxi, Hunan, Guangxi, and Guizhou). First, ten provinces were selected from a total of 31 provinces in mainland China. Thereafter, four counties from each province were sampled except for Jilin province, which has five counties recruited to achieve the sample size requirement for each province. A total of 41 counties were recruited. This was followed by three to six towns and/or villages, depending on their population size, to be selected from each county.

The survey was conducted from June to October, 2006. Sociodemographic and birth data were collected from a household survey, including ethnicity, child sex, education and occupation of parents, household income, and gestational age. Provincial variables included economic status and geographic location. The officially reported yearly provincial gross domestic product (¥100 billion RMB/yr) in 2005 was adopted as the indicator for provincial economic status. The 10 provinces were divided into Southern and Northern areas according to a customary definition based on geographical location: six Southern provinces (Jiangsu, Sichuan, Jiangxi, Hunan, Guangxi, and Guizhou) and four Northern provinces (Jilin, Shanxi, Xinjiang, and Gansu) (Fig 1).

Children who lived with an agricultural-registered parent in rural areas for a duration of at least two thirds of their age were identified as rural children and eligible for this survey. However, we excluded the children according to the following conditions: (1) born prematurely or low birth weight; (2) polyembryony; and (3) too fat or too thin because



FIGURE 1. The geographic locations of the investigated provinces within China. (The color version of this figure is available in the online edition.)

Download English Version:

<https://daneshyari.com/en/article/6042306>

Download Persian Version:

<https://daneshyari.com/article/6042306>

[Daneshyari.com](https://daneshyari.com)