

# 中国6省市人细小病毒B19流行病学调查

樊金萍<sup>1</sup> 林林<sup>1</sup> 李少春<sup>2</sup> 耿彦生<sup>2</sup> 李秀华<sup>1</sup> 孟淑芳<sup>1</sup>

1、中国食品药品检定研究院, 细胞室; 北京市天坛西里2号 100050;

2、河北大学; 河北省保定市五四东路180号 071002

**摘要** 背景 人细小病毒B19是细小病毒属的成员,是唯一对人类有致病性的细小病毒。B19的传播途径除了通常的呼吸道和母婴垂直传播外,也可通过输血或血液制品的输注而感染。2004年欧盟开始对生产人用抗D免疫球蛋白的血浆库以及经过病毒灭活的血浆库中B19病毒进行限制, B19的DNA含量不得超过104IU/ml。FDA也于2009年6月发布企业指导原则,鼓励其对献血员或血浆池进行核酸检测,终产品B19病毒的含量控制在104 IU/ml以下的水平。我国目前尚未开展对人源血浆库和血液制品的B19病毒筛查,商业化的筛查试剂也未进口。因此了解我国献血员中B19病毒的感染情况及流行株的基因型,对于保证血液制品安全具有重要意义。**目的** 了解人细小病毒B19在献血员及HIV感染人群中的流行情况及流行病学特征。**方法** 收集中国南北方6省市的自然人群及HIV感染人群的血清样本共1008份,应用酶联免疫法(EIA)检测人细小病毒B19-IgG、IgM,应用荧光PCR检测人细小病毒B19核酸,核酸阳性的样品经套式PCR后进行基因测序及基因型分析。**结果** 献血员血清样本中,沈阳地区人细小病毒B19-IgG、IgM阳性率分别为24%(67/276)和17%(42/276);天津地区IgG、IgM阳性率分别为33%(103/216)和7%(24/326);贵州地区IgG、IgM阳性率分别为52%(21/40)和15%(6/40);武汉地区IgG、IgM阳性率分别为48%(103/216)和11%(23/216)。贵州、安徽、新疆地区HIV感染人群IgG阳性率较高,分别为90%(46/51)、95%(57/60)和77%(30/39),IgM阳性率分别为2%(1/51),0(0/60)和18%(7/39)。献血员与HIV感染人群中B19核酸检出率均在2%以下。南方省市人细小病毒B19感染率显著高于北方省市。HIV感染人群感染率明显高于献血员人群。序列测定结果表明,所有B19阳性样品中的病毒序列高度保守,均为基因型I型。**结论** 人细小病毒B19在中国自然人群中有一定感染率,流行存在地域差异,南方地区明显高于北方。HIV感染人群较之献血员人群显著易感。我国6省市流行株为基因型I型。特别是B19 DNA阳性的献血员样品存在较高的输血传播的风险。鉴于HIV感染人群较之献血员人群显著易感的现状,对于此类免疫力低下的患者,输血传播的风险就更高,可在输血前对所输血液作B19核酸筛查,以进一步提高输血安全性。

**关键词** 人细小病毒B19; 流行病学

## Epidemiological Investigation of Human Parvovirus B19 in Six Regions of China

Fan Jinping<sup>1</sup>, Lin Lin<sup>1</sup>, Li Shaochun<sup>2</sup>, Gen Yansheng<sup>2</sup>, Li Xiuhua<sup>1</sup>, Meng Shufang<sup>1</sup>,

1、National Institutes for Food and Drug Control, Beijing 100050, China.

2、Hebei University, Baoding 071002, China.

**Corresponding author** Meng Shu-fang, E-mail: mengsf@263.net

**Abstract** Human parvovirus B19, a member of the Parvoviridae family, is the only parvovirus known to be a human pathogen. The virus is spread by the respiratory route, vertical transmission and blood component transfusion. The European Pharmacopoeia monograph Human Anti-D Immunoglobulin stipulates that as of the 1 January 2004, manufacturing pools for the production of anti-D immunoglobulin must contain less than 104 IU/ml of parvovirus B19 DNA. The Food and Drug Administration (FDA) proposes the same limit in reducing the burden of parvovirus B19 for manufacturing pools in the USA. To determine the epidemiological characteristics of human parvovirus B19 in China, and to investigate the prevalence of human parvovirus B19 antibody in HIV-infected people compared with non-HIV-infected people, we collected 1008

serum samples from HIV-infected and non-HIV-infected people and tested for B19 IgG and IgM antibody by EIA, at the same time, we examined B19 DNA by FQ-PCR and differentiated the genotype according to sequencing. In non-HIV-infected people, the prevalence of anti-B19 IgG and IgM were 24%(67/276)and 17%(42/276)in Shenyang, 33%(103/216)and 7%(24/326)in Tianjin, 52%(21/40)and 15%(6/40)in Guizhou, 48%(103/216)and 11%(23/216)in Wuhan respectively. In HIV-infected people, the prevalence of anti-B19 IgG was 90%(46/51)、 95%(57/60)and 77%(30/39), meanwhile the IgM was 2%(1/51),0(0/60)and 18%(7/39) in Guizhou, Anhui and Xinjiang respectively. The viral DNA could be detected was no more than 2% in all six regions. In general, the prevalence of B19 was higher in the South than in the North. The infection rate was significantly higher in HIV-infected people than in non-HIV-infected people. By comparing the partial B19 sequences, all the isolated viruses were genotype I and their nucleotides were high conserved. We should screen the infection of Human parvovirus B19 in China because of its certain infection rate in these six regions. Meanwhile there were distinct epidemiological characteristics in different regions, and the infection rate was significantly higher in HIV-infected people than in non-HIV-infected people. The genetic diversities were shown to be very low among these prevalent strains. These data illustrate that the prevalence of the B19 in six regions of China was high, and it is therefore necessary to detect the B19 DNA to ensure the blood safety.

**Key words** Parvovirus B19, human; Epidemiology