Chagas Disease After Organ Transplantation—United States, 2001

From the Centers for Disease Control and Prevention

Chagas disease (American trypanosomiasis) is caused by the protozoan parasite Trypanosoma cruzi. Chagas disease following solid-organ transplantation has occurred in Latin America, where Chagas disease is endemic, but has not been reported previously in the United States. This report describes three cases in the United States of T. cruzi infection associated with transplantation of organs from a single donor. CDC and the U.S. organ transplantation organizations will consider whether to recommend screening of potential donors for T. cruzi infection and, if so, which donors to screen, how to screen, and what to do if the screening tests are positive.

On April 23, 2001, a physician notified CDC of an acute case of Chagas disease. A woman aged 37 years who had received cadaveric kidney and pancreas transplants on March 5 returned to the hospital on April 19 for evaluation of a febrile illness. On April 23, T. cruzi trypomastigotes were identified on a peripheral blood smear. Subsequently, two other persons who had received organs from the same donor—a woman aged 32 years who had received the liver and a woman aged 69 years who had received the other kidney—were found to be infected with T. cruzi. Cultures of blood from all three recipients were positive for T. cruzi. The donor, an immigrant from Central America, presumably had been infected with T. cruzi; however, no specimens from the donor were available for testing.

After infection was detected, the recipients were treated with nifurtimox provided by the CDC Drug Service, which provides U.S.-licensed physicians with drugs that otherwise would not be available in the United States. The woman aged 69 years who had received a kidney was treated for approximately 4 months and, as of March 2002, has done well with no evidence of recurrence of T. cruzi infection. The other two patients died. The recipient of the kidney and pancreas transplants, who was the most immunosuppressed of the three patients, experienced recurrent, symptomatic T. cruzi parasitemia several weeks after completing a 4-month course of treatment with nifurtimox. On October 8, she died of acute Chagasic myocarditis, 2 weeks into her second course of nifurtimox therapy. On July 8, after several weeks of nifurtimox therapy, the recipient of the liver died of sepsis and hepatic and renal failure, which were unrelated to T. cruzi infection.

Reported by: CF Zayas, MD, C Perlino, MD, A Callendo, MD, D Jackson, MT (ASCP), EJ Martinez, MD, P Tso, MD, TG Heffron, MD, Emory Univ School of Medicine, Atlanta, Georgia. JL Logan, MD, Univ of Arizona College of Medicine, Tucson. BL Herwaldt, MD, AC Moore, MD, FJ Steurer, MS, C Bern, MD, JH Maguire, MD, Div of Parasitic Diseases, National Center for Infectious Diseases, CDC.

CDC Editorial Note: Chagas disease is endemic in parts of Central and South America and Mexico, where an estimated 16-18 million persons are infected with T. cruzi. An estimated 25,000-100,000 Latin American immigrants living in the United States are infected with T. cruzi. In nature, T. cruzi is transmitted when mucous membranes or breaks in the skin are contaminated with the feces of infected triatomine bugs. Congenital infection and transmission by blood transfusion and organ transplantation also occur.

In humans, the acute phase of vectorborne T. cruzi infection lasts for weeks to months and typically is asymptomatic or associated with fever and other mild, nonspecific manifestations. However, life-threatening myocarditis or meningoencephalitis can occur during the acute phase, particularly in young children and immunocompromised persons. After years to decades of subclinical infection, 10%-30% of infected persons develop chronic Chagas disease, which is characterized by potentially lethal cardiomyopathy or megasymphyses (i.e., megaesophagus and megacolon). Even persons who remain asymptomatic probably are infected and infectious for life, with low levels of the parasite in blood and other tissues.

During the acute phase of infection, diagnosis involves detection of circulating organisms by microscopic examination of a fresh blood specimen or stained blood smear, hemoculture, or xenodiagnosis.

Transmission of T. cruzi infection by solid-organ transplantation (particularly renal transplants) has been reported in Latin America, where serologic screening of organ donors and recipients for antibody to T. cruzi is standard practice. In two instances, both recipients of a kidney from the same donor became infected with T. cruzi.

The cluster of three cases reported here represents the first recognized U.S. occurrence of T. cruzi infection through solid-organ transplantation. In the United States, no policies concerning the transmission of T. cruzi infection by solid-organ transplantation have been established.
screening of potential organ donors for T. cruzi infection have been established. Although serologic tests for the diagnosis of T. cruzi infection are available in the United States, the tests vary in sensitivity and specificity. No test has been licensed in the United States for screening organ or blood donors.

CDC has notified the United Network for Organ Sharing (UNOS), which operates the Organ Procurement and Transplantation Network (OPTN) under contract with the U.S. Department of Health and Human Services, about these cases of Chagas disease. CDC and the scientific committees of the OPTN/UNOS, which develops guidelines and policies for organ procurement, will consider whether to recommend screening of potential donors for T. cruzi infection and, if so, which donors to screen, how to screen, and what to do if the screening tests are positive.

REFERENCES
9 available

Progress Toward Tuberculosis Control—India, 2001

MMWR. 2002;51:229-232
1 table, 1 figure omitted

EVERY YEAR, APPROXIMATELY 2 MILLION persons in India develop tuberculosis (TB), accounting for one fourth of the world’s new TB cases. Organized TB control activities have existed in India for 40 years; however, the quality of diagnosis and treatment of TB in the public and private sectors has been variable, and TB incidence and prevalence trends have not changed substantially over this time. In 1992, the Indian government established a Revised National Tuberculosis Control Programme (RNTCP) using the directly observed treatment, short-course (DOTS) strategy recommended by the World Health Organization (WHO). The DOTS strategy consists of sustained government commitment, effective laboratory-based diagnosis, standard treatment given under direct observation, secure drug supply, and systematic monitoring and evaluation. RNTCP was implemented in pilot areas beginning in 1993; large-scale implementation of the program began in late 1998. This report summarizes the process, outcomes, and challenges of RNTCP in India. RNTCP has implemented DOTS rapidly and has yielded positive results in TB control; however, continued commitment from Indian government authorities and the international community is needed to sustain and expand this ongoing program.

During 1993-2001, under RNTCP, patients diagnosed in health-care facilities with cough lasting $\geq$3 weeks underwent three sputum smear examinations over a 2-day period. If all three acid-fast bacilli (AFB) smears were negative, 1-2 weeks of broad-spectrum antibiotics were prescribed. If some but not all of the specimens were positive, or if a patient with negative smears continued to have symptoms after 1-2 weeks of broad-spectrum antibiotics, a chest radiograph was taken, and if indicative of disease, the patient was treated for TB. All TB treatment was given three times weekly on alternate days; the diagnostic evaluation and the entire course of treatment were free of charge. During the first 2 months of treatment (intensive phase), patients were treated with isoniazid, rifampin, pyrazinamide, and ethambutol (streptomycin was added for retreatment patients, and ethambutol was omitted for smear-negative, nonseriously ill patients); every dose was observed directly by either a healthcare provider or a nonfamily community member. For the remaining 4-6 months of treatment (continuation phase), either isoniazid and rifampin or isoniazid, rifampin, and ethambutol were prepared into weekly packs, and at least the first dose each week was observed directly. To prevent drug shortages during TB therapy, medications for both phases of treatment were maintained in individualized patient boxes containing the entire course of treatment for a given patient at the health facility or residence of the community volunteer providing DOTS. Recording and reporting of case detection and treatment outcomes were conducted according to WHO recommendations.

As of November 2001, RNTCP offered TB control services to regions comprising $\geq$40% of the country’s population ($\geq$440 million persons), compared with <2% in mid-1998. To prepare for service delivery under RNTCP, since 1998, approximately 3,000 small laboratories have been upgraded for smear microscopy, 2,000 contractual staff hired, approximately 200,000 health-care workers trained in different aspects of DOTS service provision, and approximately 500 million tablets of anti-TB medication distributed.

During 2001, approximately 300,000 adult outpatient visits were recorded per day in facilities covered by RNTCP, with approximately 3,000 patients examined for TB and approximately 1,300 patients started on treatment each day of operation. Indicators of the quality of case-detection activities include the proportion of patients with newly diagnosed pulmonary TB who are sputum smear–positive for AFB (which should be $\geq$50% in a well-functioning program). During April-June 2001, 179 (95%) of 189 districts reported that $\geq$50% of all new pulmonary TB patients were diagnosed as sputum smear–positive for AFB, indicating high diagnostic quality in these districts.

One year following the start of treatment, 256,621 (80%) patients had been treated successfully, and 98,302 (81%) patients who were initially sputum smear–positive had laboratory evidence of sputum conversion to negative. During April-June 2000, 77 (75%) districts had treatment success rates of $\geq$80%. However, previously treated patients had outcomes that were slightly less favorable than new TB patients (71% versus 83% treatment success). Patients who had previously failed treatment (those who were sputum smear–positive at 3 months or later during an earlier course of treatment) had a significantly higher risk for remaining...
smear-positive when treated again than did other types of retreatment patients, such as successfully treated patients that relapsed or those who prematurely discontinued treatment (12.9% versus 5.8% and 5.2% respectively, p<0.001).

Reported by: CR Khatri, MD, Ministry of Health and Family Welfare; TR Frieden, MD, Stop Tuberculosis Unit, World Health Organization, Regional Office for South East Asia; India Country Office, World Health Organization, New Delhi, India. CR Wells, MD, Div of Tuberculosis Elimination, National Centers for HIV, STD and TB Prevention; L Thorpe, PhD, EIS Officer, CDC.

CDC Editorial Note: Despite the availability of highly effective and inexpensive drugs, TB causes more deaths per year in India (421,000) than malaria, hepatitis, meningitis, nutritional deficiencies, sexually transmitted diseases, leprosy, and tropical diseases (e.g., dengue fever, trypanosomiasis, schistosomiasis, leishmaniasis, lymphatic filariasis, and onchocerciasis) combined (258,000). Since 1993, India has implemented successfully a TB control program using the WHO-recommended DOTS strategy. Many of the principles for diagnosis and treatment of the DOTS strategy were derived from studies conducted in India that demonstrated the effectiveness of ambulatory treatment of TB, the necessity and feasibility of DOTS, the efficacy of intermittent treatment with anti-TB drugs (twice weekly rather than daily), and the feasibility of case detection through sputum smear microscopy in primary-care settings. However, only recently have these findings been applied widely to establish TB control in large areas of India. The 4% death rate recorded in RNTCP areas since implementation is substantially lower than previously documented death rates of up to 29% among treated smear-positive TB patients in non-RNTCP areas.

Several obstacles impede the expansion of TB control under RNTCP. First, diagnosis and treatment of TB are uncoordinated and inconsistent because many patients initially receive TB care through the large private health-care sector, pharmacies often sell anti-TB drugs over the counter, and TB notification requirements are not enforced routinely. Second, poverty impedes program performance. Many areas lack regular electric supply, limiting the effectiveness of binocular microscopy. Economic hardships and drought cause large-scale migration, reducing treatment completion and cure rates. Third, a patient-centered approach to care—one that actively helps patients by providing them with transportation to health facilities, food, and social support to overcome obstacles to completion of treatment—is not practiced widely in India. Fourth, anti-TB drug resistance, which reflects current or past poor program performance, is difficult to treat and might account for the noticeably higher treatment failure rate among retreated TB patients. In several surveyed areas of India, 1.0%-3.3% of new TB patients have multidrug-resistant TB (MDR-TB), which is resistant to at least isoniazid and rifampin, the two most effective anti-TB drugs. This is higher than in many countries, but much lower than in some high-prevalence areas (e.g., areas in the former Soviet Union and New York City in the early 1990s). However, even if as few as 2% of new patients were to have MDR-TB, this would represent an estimated 20,000 new infectious cases of MDR-TB in India every year. In areas with relatively good performance, pilot projects of expanded programs to treat MDR-TB should be considered.

Finally, although this report does not assess the level of human immunodeficiency virus (HIV) infection among TB patients, the increasing prevalence of HIV in India represents a serious threat to TB control efforts. Approximately 4 million persons in India (<1% of the population) are infected with HIV, of which approximately half also are infected with M. tuberculosis. An additional 140,000 TB cases have been estimated annually among tuberculin skin test-positive HIV-infected persons. The TB control program in India, already one of the largest public health programs in the world, continues to expand, with plans to cover 80% of the country by 2004 and 100% by 2005. The implementation of RNTCP has resulted in a net savings of more than $400 million in economic costs; effective nationwide implementation by 2005 would save more than $27 billion through 2020. Sustaining and expanding this program will require continued high-level commitment from the central and state governments of India, supplemented by continued and coordinated assistance from international and bilateral organizations.

Progress toward TB control in India is critical to global TB control and has direct implications for TB elimination efforts in the United States because nearly half of all TB cases in the United States occur among foreign-born persons, a substantial proportion of whom (nearly 10%) are immigrants from India. With immigration from India to the United States rising, India’s proportionate contribution to U.S. domestic TB will probably increase.

REFERENCES
10 available

©2002 American Medical Association. All rights reserved.
telephonenumber (301) 656-0003, extension 19; fax (301) 907-0878; and e-mail resistance@nfid.org.

**Manufacturer’s Recall of Rapid Assay Kits Based on False Positive Cryptosporidium Antigen Tests—Wisconsin, 2001-2002**

**MMWR. 2002;51:189**

The Wisconsin Division of Public Health and the Wisconsin State Laboratory of Hygiene (WSLH) reported that a recent cluster of cryptosporidiosis cases in a three-county area in southeastern Wisconsin was the result of false-positive tests. During December 1, 2001–February 1, 2002, approximately 30 cases of cryptosporidiosis were diagnosed at a laboratory in southeastern Wisconsin using the Becton, Dickinson, and Company (Franklin Lakes, New Jersey) ColorPACTM Cryptosporidium/Giardia rapid assay (lot number 219370, expiration date 2002-06-05). Seventeen stool specimens, which were collected from 11 patients and tested positive by the rapid assay, were re-evaluated at WSLH. Six of these stool specimens were in EcoFix (Meridian Bioscience Inc., Cincinnati, Ohio), eight were in Cary-Blair transport media, and three were formalin fixed. All 17 specimens tested negative for Cryptosporidium at WSLH using the hot safranin stain and MeriFluor (Meridian Bioscience Inc., Cincinnati, Ohio) Cryptosporidium/Giardia direct fluorescent antibody kit with concentrated specimens.

For comparison, WSLH repeated the rapid assay tests of the specimens using Becton, Dickinson, and Company ColorPACTM Cryptosporidium/Giardia rapid assay from the same lot used at the southeastern Wisconsin laboratory. Eleven (65%) of the 17 stool specimens were positive on repeat testing, including five (88%) in EcoFix, four (50%) in specimens in Cary-Blair transport media, and two (67%) of the formalin-fixed specimens. The ColorPACTM kits also were used to test four known Cryptosporidium negative stool specimens, and two of these tests were positive. Becton, Dickinson, and Company has voluntarily recalled this lot from laboratories.

**Reported by:** T Haupt, MS, JP Davis, MD, Wisconsin Div of Public Health; D Warshauer, PhD, Wisconsin State Laboratory of Hygiene. M Beach, PhD, S Johnson, MS, Div of Parasitic Diseases, National Center for Infectious Diseases; D Croft, MD, EIS Officer, CDC.

**Availability of Continuing Education CD-ROM Program on Strategies to Increase Adult Vaccination Rates**

**MMWR. 2002;51:191**

The Association of Teachers of Preventive Medicine (ATPM) and the National Immunization Program (NIP)/CDC have released “Increasing Adult Vaccination Rates: WhatWorks,” an interactive instructional program on CD-ROM that offers primary-care providers strategies to increase vaccination rates among their adult patients.

The program gives users the opportunity to test their knowledge of vaccine usage and explore facts about vaccine-preventable diseases; access reference materials and answers to frequently asked questions; review information about effective strategies (e.g., standing orders, chart reminders, and mailed/telephoned reminders) and test their knowledge of how to best implement these strategies; and develop a customized adult vaccination action plan for their practice.

The CD-ROM features web links to appropriate resources, predominantly those on the NIP/CDC Web site. The program is approved for 2 hours of Continuing Medical Education credit, 2.3 hours Continuing Nursing Education credit, and 0.2 hours Continuing Education units through CDC.

WhatWorks can be ordered free of charge through ATPM at http://www.atpm.org. Additional information is available through ATPM, telephone (800) 789-6737, or by e-mail at whatworks@atpm.org.

**Satellite Broadcast on HIV Prevention**

**MMWR. 2002;51:238-248**

“REVISED RECOMMENDATIONS FOR HIV Screening of Pregnant Women,” a satellite broadcast, is scheduled for Thursday, April 25, 2002, at 1 PM, EST. The 2-hour forum is cosponsored by CDC and the Public Health Training Network, and describes CDC’s revised recommendations for HIV screening of pregnant women.1 Presentations and interviews will provide an update on implementation issues for the revised recommendations and identify special populations at high risk of perinatal transmission of HIV. This broadcast is designed for community-based organizations, service providers, and other persons in contact with women of childbearing age about any health matters such as prenatal care, primary care, and substance abuse. Viewers can fax questions and comments before and during the broadcast. Additional information is available at http://www.cdcnpin.org/broadcast and through CDC’s Fax Information System, telephone (888) 232-3299, by entering document number 130036 and a return fax number. Organizations setting up viewing sites are encouraged to register online or by fax as early as possible so that viewers can access information about viewing locations when visiting the website or calling the information line.

**REFERENCE**

1. CDC. Revised recommendations for HIV screening of pregnant women. MMWR 2001;50(No. RR-19).