

Health and Developmental Issues of Internationally Adopted Children

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International Pediatric Health Services, PLLC

Dr. Jane Aronson
151 East 62nd Street, Suite 1A
New York, NY 10065
P: 212-207-6666
F: 212-207-6665

When evaluating a child who is newly adopted from abroad, the healthcare provider who first encounters the adoptive family in the office setting is essentially creating a medical history from the limited pre-adoption medical information from the country of origin, the parent(s) experience with the child since adoption, and information collected during a thorough initial medical and developmental evaluation hopefully performed within the first few weeks after the child's arrival.

Pre-adoption medical information

Most children adopted internationally do have pre-adoption medical abstracts that are quite limited.¹ There is rarely pre-natal care for orphans/foundlings, and the transfer of information from birth mothers in maternity hospitals to orphanages in most countries is almost non-existent. In Russia, women often deliver babies at home or in a hospital and they leave the hospital quickly, relinquishing the child to the state. Because most children adopted from China are abandoned and found in public places, there is no pre-natal or birth/delivery information available. Orphanage staff make their best guess about the age of the child, although sometimes there is a "date of birth" note pinned to the child's clothing.

This is in contrast to South Korea, with its excellent foster care system, where there is full disclosure of medical information, good pre-natal care, and opportunities to make inquiries about medical conditions in order to complete any missing information about the child's medical and developmental course while in foster care.

On the whole, the flow of information about children about to be adopted from all countries abroad continues to improve. That said, there are a number of health issues common to children who have been living in orphanages, and enough medical experience has been accumulated since the mid- to late-eighties when international adoption began to grow in the U.S. making this information quite accessible and easy to know in the context of a primary care general medical practice.²

From the most recent official Immigration and Naturalization statistics by end of 2002,³ there were 20,099 children adopted from abroad with 5,053 from China and 4,939 from Russia. Other popular countries for Americans to adopt from in 2002 were Guatemala, South Korea, Ukraine, and Kazakhstan. International adoption reflects the "geopolitics" of the world, thus resulting in the shifting of numbers and countries from year to year.

Health Issues

Latent Tuberculosis Infection (LTBI)

From data from a retrospective cohort study of 504 internationally adopted children in 1997 and 1998 done by this author,⁴ 10.4 % of children adopted from China had LTBI and 30% of children adopted from Russia had LTBI. This clearly reflects the endemicity of TB in China and Russia and should reinforce the need for such testing regardless of BCG status.⁵ These children had negative chest films and were prescribed isoniazid (INH) once a day for nine months, which in children is quite tolerable and safe. Per this author's experience, INH without sorbitol causes less diarrhea and would be the preferred product to

ensure compliance for nine months. Liver enzymes were acquired at baseline, but were not followed unless there were symptoms to warrant those studies.

Hepatitis A, B, C

Hepatitis A is a fairly mild infectious disease in children transmitted mainly in food and water in most countries outside of the U.S. It can cause irreversible, even fatal damage to the liver in adults, but it doesn't have a carrier state or a chronic state which is how it differs from Hepatitis B and C. It would not be necessary to test for Hepatitis A unless the child has transaminase elevations and/or was symptomatic with liver disease i.e, jaundice. Hepatitis A is preventable with a two-vaccine series, administered six to twelve months apart, and is recommended for all families traveling abroad to adopt children from orphanages as it is highly transmissible in households and while traveling outside the U.S.⁶

Hepatitis B and C, on the other hand, both have a chronic carrier state that can potentially cause chronic active hepatitis, cirrhosis and cancer of the liver. In the study cited above⁴ 2.8% of the children evaluated were positive for Hepatitis B surface antigen. Three-point-three percent were positive from China and 2.6% were positive from Russia. Hepatitis B vaccine is required for school entry in the United States and should be given to adults/parents traveling abroad to adopt children due to the high risk of acquisition of this infection from their children who could be potential carriers of this infection.^{7,8} Anecdotally, in the five years since Saiman et al.,⁴ this author has seen fewer children with carriage of Hepatitis B. More reliable testing abroad, testing of children at an older age, and more widespread vaccination in the orphanage probably all contribute to the change in prevalence in the carrier state of adoptees.

Hepatitis C serology was obtained in 98% of the study participants⁴ and 4 were found to be antibody positive, but all were negative for viral RNA and 2 children remained positive after 1 year of age; one is 8 years of age and has normal transaminases and negative PCR and the other is lost to follow-up. In the practice of adoption medicine most recently, more and more pre-adoption reports from Russia include Hepatitis C tests with positive results. Reports of blood transfusions are also more common. This is obviously important information for parents to be aware of during the adoption process. Hepatitis C infection cannot be diagnosed in a child under the age of one year, no matter what tests are performed, and transfusions in children living in orphanages anywhere in the world should be seen as highly risky for Hepatitis B, C, and HIV infection.

HIV

This is a rare disease in adoptees, but HIV has an evolving epidemiology. This author undertook a study of HIV prevalence in adoptees in the Spring of 2001 in preparation for a presentation at the Medical Institute of the Joint Council on International Children's Services (www.jcics.org) in April 2001 in Washington, D.C. Seventeen adoption centers in the U.S. participated and about 7,300 children were tested for HIV on arrival in the U.S. Fifty-nine children were ELISA positive for HIV and 12 children (0.16%) were found to have HIV infection. Of the 12, there was 1 child from Russia diagnosed in 1998, 4 from Cambodia, 4 from Romania, 1 from Panama, and 2 from Viet Nam. Ten-twelfths (83%) of the children were negative at time of referral for adoption and then were found to be infected on arrival in the U.S.

Much has changed since the author collected this data. China instituted mandatory testing in summer/fall 2002 for all children referred for adoption in orphanages in China, reflecting the HIV crisis in China revealed in Elisabeth Rosenthal's *New York Times* series on the epidemic of HIV in China.⁹ HIV testing in Cambodia was moved from the Aurore lab to the illustrious Pasteur Institute and included PCR testing (Cambodia has since closed to international adoption completely). Adoption from Romania is in moratorium since the study, and the children who tested positive from Romania were children adopted in the early 90s when there was no testing for HIV in that country. The author has seen no children infected with HIV in 10 years of practicing adoption medicine and evaluating about 2,400 children in person.

Syphilis

Syphilis has turned out to be a rare diagnosis in children adopted from abroad. Though we see a lot of medical reports from Russia¹⁰ that syphilis is epidemic, we rarely see the disease. This author typically sees "syphilis exposure" on about 10-15% of Russian pre-adoption medical abstracts. The vast majority

of these children are reportedly treated with Penicillin injections for at least two weeks and in some cases for 30 days. This is likely why it is rare in Russia.

It is rare in adoptees from China.^{11,12} Out of 2,400 kids seen in my office personally since the early 90s, I have three affected families with 5 infected children. Two children had congenital syphilis and were treated effectively on arrival with no long-term sequelae. Three sisters were diagnosed in November 2003 and were likely sexually abused by their stepfather in a Russia hospital, and were treated with Penicillin for 14 days and did well.

Parasites

In Saiman et al, 87/461 (19%) of children tested had evidence of *Giardia lamblia* by antigen detection and/or parasite identification. Being born in Eastern Europe was a risk factor for the acquisition of *Giardia*. The next most common parasite was *Dientamoeba fragilis*. A handful of children had bacterial pathogens such as *Campylobacter*, *Shigella* and *Salmonella*.

Frequent refractory cases of *Giardia* led this author to use 30 mg per kg of metronidazole benzoate for 14 days instead of 15 mg per kg for 5 days. A pharmacy in Cheshire, Connecticut (1-800-861-0933) was found to be the best source of anti-parasite medication suspensions with palatable flavors/textures leading to excellent compliance. In spite of the controversy around whether to treat children with asymptomatic *Giardiasis*, this author has always opted to treat for two reasons:

1. Children in orphanages fail to thrive, and *Giardia* may contribute to malabsorption of nutrients leading to poor growth and development.
2. *Giardia* is quite transmissible in a household, especially when the patient is not toilet-trained.

Helicobacter pylori and reflux esophagitis

From time to time the author has encountered a newly-adopted child with recurrent episodes of reflux, vomiting and irritability. Though there are few studies of this entity in orphans,¹³ this author has encountered children with these symptoms. Some have tested positive for *H. pylori* antigen in the stool; treatment of this entity according to established regimens with several antibiotics and ranitidine (H2 antagonist) has been successful, with patients becoming miraculously symptom-free.

Lead Poisoning

Thirteen percent of Chinese adoptees had elevated blood lead levels on arrival. Rarely was lead elevated in adoptees from other countries.¹⁴ Only one child in this author's practice of 10 years, a 14 month old toddler adopted from China, had to be treated with 20 days of Chemet for lead poisoning with a level of 48 ug/dl. She did well and was developmentally normal. It is assumed that lead poisoning in China comes from lead-containing gasoline and coal-burning used for industry and home heating and cooking.

Immunization records of Adoptees

As immunization becomes more widespread and systematic in orphanages, and vaccines become more effective, health professionals are faced with a new dilemma regarding the recent arrivals: to immunize from the beginning regardless of records or to use antibody titers and available schedules to create a unique immunization plan. This has been an unfolding issue.

In a study published in 1998 involving a small number of adoptees, "only 35% of Chinese, Russian, and EE adoptees exhibited protective titers to diphtheria and tetanus."¹⁵ In similar studies^{16,17,18,19} over the last few years, there is increasing evidence that using antibody titers may be a more judicious approach to this issue. The most recent of these studies¹⁹ involved this author's practice and studied the records of 113 children adopted from abroad through May 2003; as high as 97% of children had acceptable titers of diphtheria, 96% for tetanus, 94% for polio, and 77% for Hepatitis B. These data are quite impressive as compared to older studies and support the use of antibody titers for children over one year of age (avoiding the issue of residual maternal antibodies) along with a compulsive review of intervals for vaccines.

It has been the thinking of adoption medicine specialists that vaccines done in Guatemala, South Korea, India, and Thailand are performed most uniformly in keeping with U.S. guidelines, and are likely acceptable for younger children. It is this author's recommendation to consider repeating vaccines for children under one year of age if they are adopted from Russia and China, and to use the schedule along with antibody titers per the *Redbook* to create an individualized schedule for children over one year of age from these countries.²⁰

Alcohol-Related Neurodevelopmental Disorders

There is no way to establish accurate data for the prevalence of FAS or FAE in adoptees because of the lack of accurate family history. We do know that there are no education programs warning pregnant women about the deleterious effects of alcohol on the unborn child, and that drinking during pregnancy is quite common almost everywhere in the world, including the U.S. where there are public warnings. It is essential that families understand that exposure to alcohol cannot be diagnosed, but rather surmised from a child's development and behavior, and that the diagnosis of the facial features of FAS is challenging. The diagnosis of the facial features of FAS is the focus of photo and video evaluations for pre-adoption assessments for families adopting children from Russia and Eastern Europe.

Malnutrition, failure to thrive, rickets, iron deficiency anemia, zinc deficiency, scabies, eczema

Under-nutrition and the absence of crucial elements, especially micronutrients like iron, zinc, calcium, and vitamin D, is rampant in orphanages. Children living in orphanages abroad commonly have rickets (vitamin D, calcium deficiency), iron deficiency anemia, zinc deficiency, and eczema due to poor nutrition. Due to these conditions children do not grow optimally and fail to thrive.²¹

Rickets causes low muscle tone, box-like shaped heads, frontal bossing, and bowing of the lower extremities.²² Rickets resolves swiftly with re-nourishment and physical activity, but some children continue to have low muscle tone chronically and may require physical therapy. Children with severe rickets may be misdiagnosed with muscle diseases and cerebral palsy.

Iron deficiency anemia is easily treated with iron, and should be distinguished from alpha and beta Thalassemia which are commonly found in Asian children and are not diseases.

Zinc deficiency is likely a cause for frequent respiratory infections in orphanages, as well as refractory eczema and acrodermatitis enteropathica.²³

Children in orphanages with poor skin integrity are at risk for scabies and bacterial infections such as impetigo; these are easily managed on arrival in the U.S., but scabies is commonly missed as it often doesn't appear in its classic form. It also leads to "acropustulosis" which is misunderstood and managed ineffectively with repeated treatment of scabies, rather than simple moisturization and patience.

Developmental Delays and Long-term issues

Development is the most important long-term issue in adoptees from abroad, but it is impossible to do this topic justice in a survey article of this nature. Most children adopted from abroad are delayed on arrival in the U.S. and have amazing recovery.^{24,25} Per this author's experience, only about 60% of these children will qualify for Early Intervention (EI), which is provided free through the Department of Health in each county for children less than 36 months of age and provides physical therapy, occupational therapy, speech and language therapy in the home for families with children who qualify.

Pediatricians should be aggressive about using the Denver II for each well-child visit and referrals for EI should be proactive. Children frequently show later signs of delay when they are challenged in a school environment, and these delays usually involve language. If delays are not managed appropriately, children can develop behavioral problems which unnecessarily can undermine self-esteem. Children who

are adopted need the support of their pediatricians, school teachers and their peers to understand their special identity issues as well.²⁶

There are increasingly more academic long-term studies that healthcare professionals have undertaken in the last few years to provide resources for families through international adoption. The International Adoption Project at the University of Minnesota began in 2000 and has registered more than 3,000 families. The website <http://education.umn.edu/icd/iap>²⁷ includes a newsletter with articles focused on long-term medical and developmental issues.

Recommended Screening Tests and Evaluations²⁸

- Antibody titers for children over one year of age who have a credible vaccine record from the country of origin
 - diphtheria antibodies
 - tetanus antibodies
 - polio neutralizing antibodies for type 1, 2, 3
 - chicken pox antibodies
 - measles, mumps, rubella (depends on the country and reliability of these vaccines)
- HIV-1,2 ELISA
- Hepatitis B serology (Hep B surface antibody, Hep B surface antigen, Hep B core antibody total)
- Hep C EIA
- Hep A total with reflex to IgM in case of acute infection
- Syphilis serology (RPR, FTA-ABS)
- Lead Level (venous)
- Complete Blood count with differential and platelets
- Hemoglobin electrophoresis
- Thyroid screen
 - TSH
 - Free T4
 - Total T4
- Rickets screen
 - Alkaline phosphatase
 - Calcium
 - Phosphorus
- Liver Enzymes
 - ALT
 - AST
- Kidney Function tests
 - BUN
 - Cr

- Audiology evaluation for all children adopted from abroad (unknown birth history and possible prematurity)
- Vision screening by a board certified pediatric ophthalmologist for all children adopted from abroad (unknown birth history and possible prematurity)
- Dental visit with a pediatric dentist should be done by 18 months of age (poor nutrition, rickets, exposure to sugar in the bottle with bottle propping)
- TB skin test (TST) on arrival and again 6 months from the time of arrival (If the BCG site is not healed, wait until it is healed and if more than a few months is needed for healing, consider having a chest x-ray; then do the TST when the BCG scar is completely healed)
- Consider repeating HIV, Hep B, C 6 months after arrival (lengthy incubation periods and exposure just at the time of departure).
- Full developmental assessment on arrival and every few months to determine the need for Early Intervention

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