

VIEWPOINT

A Standard of Care



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Clinic near Yerevan, Armenia. “Doctor, my boy fights with other children, he hits them for no reason. Can you help him to be less aggressive...?” As a visiting pediatric neurologist in Armenia, I’ve noticed that this kind of question comes up fairly often. The boy’s family, doctors, and nurses have all gathered around to observe the visit. I ask this 8 year old, through an interpreter, if he is having any trouble following the rules. Looking downward with shame, he shakes his head “no.”

Leaving the clinic, I ask the family doctor accompanying me about this case. In Armenia, just as in the United States, clinicians sometimes express frustration over parents bringing their child in for relatively benign concerns, as though they were continually braced for a disaster threatening their child. As in the United States, Armenian parents often bring their children to the doctor for concerns about behavior. They want to know whether this visiting American specialist will have anything else to offer.

We studied the medical history and exam. The Armenian clinicians were already addressing the possible contributors to their pediatric patients’ executive function difficulties: emotional stresses, mental illness or disorganization at home, sleep disorders, nutritional or genetic factors, parental conflict; consider attention deficit disorder, psychological referral if resources permit. The one consideration I could add: lead poisoning.

As we’ve known in the United States for more than 40 years, aggressive, impulsive behavior in children can indicate lead poisoning of the brain. But it’s not clear if or whether a visiting American pediatric neurologist should broach this topic with these families: No facilities for blood lead determination are available. Moreover, no infrastructure exists to remediate the exposure sources.

In Armenia, potential exposure sources include gold, copper, and molybdenum mining sites. Mining for such metals, which continue to be some of the country’s leading exports, expanded in Armenia and other former Soviet nations during the Soviet era. In this mountainous country, a cradle of western civilization and early Christianity, mining has been a way of life for thousands of years. The rapid pace of mining development in turn brought ground waters into contact with the metal-bearing ores, many of which are toxic to the human nervous system. As preliminary environmental analyses have found,¹ lead exposure represents a significant health hazard to Armenian children in some metal mining communities, among other former Soviet nations, particularly those with Uranium mines abandoned since the Cold War era. Still, although it is basic curriculum to pediatrics trainees in the United States, the notion of lead intoxication as a potentially pervasive, environmental neurotoxin that may underlie these children’s poor self-control is new to these clinicians.

Of all the remediable medical causes of lost IQ points, lead poisoning has been perhaps the single most successful developmental intervention collectively executed by clinicians who see children in the last 50 years.² Since the clinical studies of Herbert Needleman, among others, prompted mass screening of children for blood lead, lead screening has improved the intelligence and executive skills of millions of American children. We now know that any measurable lead level, even levels below guideline thresholds for response, means that the brain’s capacity for reason, for self-control, is suffering. Observations of higher lead levels among adjudicated delinquents³ and among individuals with sexually transmitted diseases⁴ point to the far-ranging psychological, behavioral, and social implications of lead poisoning in humans.

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From a global health perspective, the current lead testing situation in Armenia evokes a number of medical anthropological, social, and historical threads. Just 1 generation away from one of the largest “single payers” the world of health care has ever known (the Soviet health care system), post-Soviet countries turned to various health finance systems. In Armenia, health care finance relies heavily on out-of-pocket payment, even as the government has endeavored to build up family-based primary care services.⁵ Government-financed health care in Armenia now guarantees free care up to age 7. For older children, the system features an evolving classification of disabilities that determines eligibility for government support. Post-Soviet countries’ epidemiological work focused almost exclusively on infectious diseases, so that efforts to define the epidemiology of life-style–related, or toxin-related conditions have little on which to build.⁶

The Soviet health care agenda emphasized prevention and treatment of infectious disease over “life-style” chronic disorders or environmental hazards. Accordingly, discussions with parents in clinic still often focus on infectious disease rather than on other kinds of systemic illness. This sensibility was also reflected in a pervasive awareness regarding the importance of complete vaccination, which was one of the greatest triumphs of the Soviet medical system. At the same time, psychological concerns remain stigmatized in Armenia, just as they are in the United States.

Armenian physicians have a strong interest in exchange—reviewing cases with visiting European and American clinicians, exploring whether and how to adopt practice guidelines. Generations of experience with vaccination has embedded in their culture the ethic of prevention. Meanwhile, in bedside clinical discussions, Armenian parents, just like American parents, express their wish that no stone, diagnostically, should go unturned. Their eyes seem to ask: “What test could you offer that could help my child? Even if the test would cost months of our income....”

Armenia has the makings of a perfect storm of pediatric lead poisoning: (1) low awareness among

clinicians about the potential magnitude of the problem; (2) no laboratory to measure lead; (3) active, mining operations: ~600 largely foreign owned mines scattered over territory the size of Maryland are the source of more than 50% of Armenia’s exports; (4) lead, leaching out of mine tailings, posing an exposure threat to children in the community⁷; (5) no effective legal recourse for poisonings sustained by mine workers or communities. Armenian scientists are just now getting a picture of the extent of soil contamination by heavy metals.¹ The prevalence of blood lead levels exceeding the reference level of 5 µg/dL among children in some Armenian communities is more than 25 times as high as the prevalence among children in the United States.

The next step will entail a more precise identification of exposure sources and a system for remediating those exposures. Children in Armenia, as elsewhere, are particularly vulnerable because of their occupational exposure (play and oral activity, soil exposure) and the susceptibility of their developing nervous system to environmental lead. Universal testing will undoubtedly benefit the intellectual livelihood of this highly education-conscious culture.

As the scope of pediatric lead poisoning in this and other post-Soviet countries emerges, clinicians and health researchers will be called on to plan and execute epidemiological and environmental studies. How can we optimize interactions between health care systems, and how can educational and technological resources be developed in a culturally respectful way? Responding to lead poisoning among Armenian children will challenge clinicians in and outside of Armenia to build new international collaborations.

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