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Lead Poisoning and Children in Foster Care: Diagnosis and Management Challenges

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Introduction

Children living in foster care face daunting challenges to their health and development, despite the best intentions of foster parents dedicated to their care. Often children in the foster care system bring with them the cumulative adverse effects of living previously in high-risk families with parents often suffering from mental illness and/or alcohol and substance abuse. Their lives are often disrupted by circumstances of abuse and neglect. The health needs of young children at the time of foster care placement have been well documented[1-3]; but few have discussed lead poisoning. Prior studies do not mention the screening of children being placed in foster care for childhood lead poisoning, even though these children are at high risk for lead poisoning.[4,5]

Once children of preschool age with elevated blood lead levels (eBLL) are placed into foster care, or after they are discovered to have an eBLL while living in foster care, the community-based services available to manage this exposure are often variable and sometimes inadequate. The aim is to develop multi-pronged approach to the screening, diagnosis, and management of childhood lead poisoning in this population to ensure that they are afforded the same opportunities as are other children. We report here 3 recent cases referred to the Boston Children's Hospital Pediatric Environmental Health Center (PEHC) for management of childhood lead poisoning, as illustrative of the health challenges faced by these children and their foster families.

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Author Contributions

MH original concept and study design; ongoing concept and study design revisions; data analysis and interpretation; manuscript writing; reviewed manuscript drafts and the final submission. **ADW** original concept and study design; ongoing concept and study design revisions; data analysis and interpretation; manuscript writing; reviewed manuscript drafts and the final submission.

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Case 1

A 2.5-year-old boy living in foster care was hospitalized for an eBLL of 60 μg/dL and, after 5 days of parenteral chelation, subsequently required multiple courses of oral chelation therapy. He had originally been placed in foster care after a family altercation. Both biological parents had underlying health problems, with reports of alcohol and substance abuse. The child's original home was found to have chipping paint and plaster, although the extent of lead paint hazards was unknown, and his first eBLL had been obtained during well-child care at the time of foster care placement. The foster mother's rental apartment was inspected and found to have numerous lead hazards. As a result, she moved to a hazard-free residence. This child also had behavioral issues of aggression and hyperactivity, as well as language and other developmental delays. The foster mother advocated for him to receive intensive special educational services and behavioral therapy, and subsequently adopted him. This child benefited from consistency of health care services, an assertive adoptive parent who secured the educational and behavioral special services her son required, and the nurturing environment of the adoptive mother's home.

Case 2

A 4-year-old girl living in foster care was referred for an eBLL of 37 μg/dL. It was thought that her original home was the source of the lead hazards. This child was relocated to new foster homes three times within 12 months, including residences in both public and private housing; none had apparent lead violations. This child also had other health issues, including a learning disability, severe behavioral disturbances, and a series of violent outbursts. Given her frequent relocations, services to evaluate her mental health and developmental needs had not been pursued; no special educational services, which are assigned by jurisdiction, or behavioral therapies were in place more than a year after her original placement. Her foster parents were variably compliant with recommended medical evaluations and interventions. Frequent changes in her guardians affected the child's adherence to medication regimens and her eBLL remained as high as 26 μg/dL despite more than 18 months of medical management.

Case 3

A 2-year-old girl living in foster care was referred to the PEHC for a venous eBLL of 36 mcg/dL. She had been placed in foster care 6 months earlier. A previous BLL obtained at 11 months of age, prior to her foster care placement, was reportedly nondetectable. Four other children, foster and biological in the home were identified as having BLL's of 5 μg/dL (two 3-year-olds) and 3 μg/dL (two 5-year-olds). The foster family's home, reportedly built more than 140 years ago, was subsequently inspected; numerous lead hazard violations were found throughout the residence, with loose, chipping paint. This child had marked pica behaviors that undoubtedly contributed to her risk of lead exposure. The foster family undertook immediate temporary abatement measures, such as dusting and damp mopping, and clean-up of chipping paint and plaster, while they secured funding for definitive renovation and lead hazard mitigation work to their residence. The child qualified for and received services through the local early intervention program. During a 4-month period of

monitoring, the patient's eBLL declined in addition to correction of an iron-deficiency anemia.

Discussion

Childhood lead poisoning is still prevalent in the United States. More than 500,000 children have BLLs above the Centers for Disease Control and Prevention's (CDC's) reference level of 5 μg/dL.[6] The CDC has recognized certain groups of pediatric patients at higher risk for lead poisoning, such as those from disadvantaged backgrounds, immigrants, and children whose siblings have eBLL.[7] A 1998 CDC study of internationally adopted Chinese children found a prevalence of eBLLs ranging from 1% to 13%.[8] Guatemalan children who were adopted or in foster care in the United States had an eBLL prevalence rate of 3%.[9] However, foster care children have not been identified by the CDC as a special group of vulnerable children for lead poisoning, despite studies suggesting that children entering foster care are at high risk.[4,8,9]

The Adoption and Foster Care Analysis and Reporting System sponsored by the US Department of Health and Human Services Administration for Children and Families reported 427,910 children in foster care in 2015, a 7.6% increase nationally since 2011.[10] Many children entered foster care secondary to reported parental drug abuse (32%) and/or reported neglect (61%).[10] The American Academy of Pediatrics (AAP) Bright Futures program and recent policy statement on lead toxicity both include lead poisoning prevention guidance for health care providers.[11,12] While the AAP has partnered with other advocacy groups in supporting the 'Healthy Foster Children America' initiative,[3] there is no information specific to the screening of children for lead poisoning while they are in foster care.

Inspection of Prospective Foster Homes

In communities with older housing, the patient population is faced with significant environmental hazards, including exposure to deteriorating lead-based paint, with lead-laden interior dust. The finding of a child with newly identified lead poisoning associated with the foster home placement, as illustrated in cases 1 and 3, provides anecdotal support for public health policies recommending lead inspection and certification of all foster homes before young children are placed there. And yet we could not identify any states that have such policies currently in place.

Economic Burden on Foster Families

The arrival of a foster child is a challenge to both the child and family in terms of transitions and setting new routines. In volunteering to be foster parents, individuals understand that children for whom they will be asked to care may bring serious medical, neurodevelopmental, and behavioral concerns. However, they may not realize that their acceptance of these placements requires compliance of their residence with state-level standards of lead-safe housing; they may not be ready to assume the economic implications of these requirements.

Need for Behavioral and Neurodevelopmental Evaluation

Children with lead poisoning have a higher risk of neurodevelopmental deficits and behavioral problems than do other children.[13,14] Yet children in foster care, as illustrated by case 2, are subject to the vagaries of placement, often disrupting continuity of care and thwarting scheduling of needed medical and developmental services.[3,15]

Need for Special Educational and Psychiatric Services

Access to comprehensive, quality health care is strongly connected to maintaining physical, social, and mental health; preventing disease; detecting and treating illness and injury; and improving the quality of life. Foster care children who move from home to home may not be afforded the same access to services as children from stable homes, since educational or health services, set up in one city or school district, may not be available in another. Even if they are, the children must repeat the process of discerning their eligibility for special educational and developmental services and valuable time is lost.

Conclusion

The health care needs of children living in foster care are challenging, and for many reasons they may be at higher risk than other children to adverse effects of lead poisoning.[3,15,16] Foster children are often transient “housing migrants,” living in homes with unknown lead hazards. Multiple home placements over time often span different cities, different social services catchment areas, and different Headstart programs and school districts, and risk a lack of coordination of helping agencies for the assessment and management of complications of lead poisoning. Unfortunately, foster children are subject to disparities in health care attendant to their unstable home environment, since they may not be in any one foster home long enough for qualified neurodevelopmental assessments to be made and multidisciplinary management plans implemented. Agencies and pediatric health care providers (Table 1) who advocate for and are involved with foster children must ensure that they are afforded the same opportunities for childhood lead poisoning screening, diagnosis, and management as are other children.

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References

1. Chemoff R, Combs-Orme T, Risley-Curtiss C, Heisler A. Assessing the health status of children entering foster care. Pediatrics. 1994;93:594–601. [PubMed: 8134214]
2. Takayama JI, Bergman AB, Connell FA. Children in foster care in the state of Washington. Health care utilization and expenditures. JAMA. 1994;271:1850–1855. [PubMed: 8196142]
3. Council on Foster Care; Adoption and Kinship Care; Committee on Adolescence; Council on Early Childhood. Health care issues for children and adolescents in foster care and kinship care. Pediatrics. 2015;136:e1131–e1140. [PubMed: 26416941]
4. Chung EK, Webb D, Clampet-Lundquist S, Campbell C. A comparison of elevated blood lead levels among children living in foster care, their siblings, and the general population. Pediatrics. 2001;107:E81. [PubMed: 11331731]
5. Bithoney WG, Vandeven AM, Ryan A. Elevated lead levels in reportedly abused children. J Pediatr. 1993;122(5 pt 1):719–720. [PubMed: 8496749]
6. President's Task Force on Environmental Health Risks and Safety Risks to Children. Key federal programs to reduce childhood lead exposures and eliminate associated health impacts 2016 https://ptfceh.niehs.nih.gov/features/assets/files/key_federal_programs_to_reduce_childhood_lead_exposures_and_eliminate_associated_health_impactspresidents_508.pdf Accessed July 25, 2017.
7. Centers for Disease Control and Prevention. Lead. At-risk populations. http://www.cdc.gov/nceh/lead/tips/populations.htm. Updated 2 23, 2015 Accessed July 24, 2017.
8. Centers for Disease Control and Prevention. Elevated blood lead levels among internationally adopted children— the United States, 1998. MMWR Morb Mortal Wkly Rep. 2000;49(5):97–100. [PubMed: 10718094]
9. Miller L, Chan W, Comfort K, Tirella L. Health of children adopted from Guatemala: comparison of orphanage and foster care. Pediatrics. 2005;115:e710–e717. [PubMed: 15930199]
10. Adoption and Foster Care Analysis and Reporting System. The AFCARS report: Preliminary FY2015. U.S. Department of Health and Human Services, Administration for Children and Families, Children's Bureau; 2016 https://www.acf.hhs.gov/sites/default/files/cb/afcarsreport23.pdf. Accessed July 24, 2017.
11. Council on Environmental Health. Prevention of childhood lead toxicity. Pediatrics. 2016;138:e20161493. doi:10.1542/peds.2016-1493. [PubMed: 27325637]
12. Bright Futures/American Academy of Pediatrics. Recommendations for preventive pediatric health care. https://www.aap.org/en-us/Documents/periodicity_schedule.pdf. Accessed July 25, 2017.
13. Lanphear BP, Hornung R, Khoury J, et al. Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect. 2005;113:894–899. [PubMed: 16002379]
14. Lidsky TI, Schneider JS. Adverse effects of childhood lead poisoning: the clinical neuropsychological perspective. Environ Res. 2006;100:284–293. [PubMed: 16442997]
15. Jee SH, Szilagyi M, Ovenshire C, et al. Improved detection of developmental delays among young children in foster care. Pediatrics. 2010;125:282–289. [PubMed: 20064864]
16. Jee SH, Conn AM, Szilagyi PG, Blumkin A, Baldwin CD, Szilagyi MA. Identification of social-emotional problems among young children in foster care. J Child Psychol Psychiatry. 2010;51:1351–1358. [PubMed: 20840498]
17. Newman N, Binns HJ, Karwowski M, Lowry J; PEHSU Lead Working Group. Recommendations on medical management of childhood lead exposure and poisoning.http://www.pehsu.net/_Library/facts/medical-mgmnt-childhood-lead-exposure-June-2013.pdf. Accessed July 25, 2017.

Table 1.

Recommendations for Screening and Management for Childhood Lead Poisoning Among Children Living in Foster Care.

Prospective foster care families whose housing were built prior to 1978 should have their homes screened for lead hazards and, if necessary, remediated prior to placement of foster children less than 6 years of age.
Prospective foster care families should qualify for local grants and loans necessary to bring their housing into compliance with state regulations regarding lead hazard abatement.
All preschool children in foster care should be screened with blood lead level at ages 12 and 24 months.
Should one preschool child living in a foster care residence be found to have an elevated BLL ≥5 μg/dL then all other foster care children <6 years old who are living in the same home should also be promptly tested.
Children with eBLL should have their foster care home environments assessed for sources of lead contamination and the children should be subsequently monitored as per current AAP and CDC guidelines.[11,17]
Foster care children identified with eBLL should have access to timely neurodevelopmental and behavioral assessment services in order to determine their educational, developmental, and psychosocial needs.
Foster care children with eBLL should receive timely and effective special educational and behavioral interventions to meet their needs.

Abbreviations: BLL, blood lead level; eBLL, elevated blood lead level; AAP, American Academy of Pediatrics; CDC, Centers for Disease Control and Prevention.