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Yemeni Families and Child Lead Screening in Detroit

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Abstract

This project was an exploratory effort to screen and treat immigrant Yemeni children who were at high risk for lead poisoning. The Detroit metropolitan area is home to the largest number of Arabic immigrants in the United States. In addition, Detroit has the largest rate of childhood lead poisoning in the state of Michigan. No published studies were found that explored the prevalence of lead poisoning among Yemeni children in Michigan. Immigrant children from countries where knowledge of lead poisoning is limited may be particularly vulnerable because of difficulties in language and accessing health care. Children's Hospital of Michigan CATCH School Mobile Health Center conducted this health-screening project. This article reports on the gender and health issues encountered during the community outreach lead testing effort within a Yemeni neighborhood in Detroit.

Keywords

lead poisoning; community outreach; Yemeni; gender issues; immigrant health

BACKGROUND

Approximately 22,000 children are diagnosed each year with lead poisoning in Michigan, with the city of Detroit accounting for the largest number of childhood lead poisoning cases in the state (Detroit Health Department [DHD], 2001; Michigan Department of Community Health, 2005). Between 1997 and 2000, more than 15,490 children in the city of Detroit were diagnosed with lead poisoning, in contrast to the rest of the state which reported a combined total of 13,704 cases (DHD, 2001). Environmental lead can be found in various places in urban environments, including homes built prior to 1978, lead-based paint used in homes, soil and dust around homes and factories, and old lead smelters and foundries. The guidelines from the American Academy of Pediatrics (1998) indicate that a lead blood level $\geq 10 \mu\text{g}/\text{dl}$ is evidence of lead poisoning and requires treatment.

Children are particularly vulnerable to ingesting lead by placing their hands in the mouth after touching dirt and dust from windowpanes, soil from outside the home, eating food or drinking water from dishes that contains lead, using folk remedies that contain lead, and pica (eating peeling paint chips off the wall; Agency for Toxic Substances and Disease Registry, 1997; Centers for Disease Control, 2005). Because children are especially vulnerable to the detrimental effects of environmental lead, community outreach efforts to screen and treat children are important. The Centers for Disease Control (2005) recommended universal lead screening in areas where more than 27% of the housing stock was built before 1950. Sixty-three percent of all of the housing stock in Detroit was built prior to 1950 (DHD, 2001).

Immigrant children from countries where knowledge about lead poisoning is limited may be at even greater risk because their parents are not aware of the dangers and have language and cultural issues that affect access to prevention measures and to health care. For this reason, a neighborhood in Detroit where 90% of the residents were Yemeni was targeted for this study. The study focuses on gender and health issues encountered during this outreach effort.

Particular challenges arise when dealing with low-income immigrant populations where barriers include not only language and culture but also lack of health insurance and access to culturally sensitive health care. To address these barriers and also increase screening rates in a neighborhood, health care providers, in collaboration with local community organizers, developed and implemented a door-to-door lead screening effort targeting a Yemeni immigrant neighborhood. The purpose of this article is to describe this community outreach effort and discuss methods used and lessons learned.

YEMENI BACKGROUND

The Republic of Yemen includes both North and South Yemen and is located in the Middle East between Oman and Saudi Arabia. Yemen is bordered by the Arabian Sea, Red Sea, and Gulf of Eden (CIA-The World Factbook, 2005; National Information Center, 2005). North Yemen was part of the Ottoman Empire until 1918, whereas South Yemen was occupied by the British until 1967. In 1970, South Yemen adopted Marxism, which led hundreds of thousands of inhabitants to migrate to North Yemen. This migration to North Yemen resulted in 20 years of discontent between the Southern and Northern regions of Yemen. These two countries united in 1990 creating what is now The Republic of Yemen, commonly referred to as Yemen. In 2000, both Yemen and Saudi Arabia agreed to a delimitation of their borders. Yemen is mostly desert and is approximately twice the size of the state of Wyoming. The Yemeni environment has soil erosion, overgrazing, limited fresh water resources, and is vulnerable to sand and dust storms. The natural resources in this region include petroleum (oil), fish, rock salt, marble, coal, gold, lead, nickel, and copper. Yemen is mostly rural and agricultural with little industrialization (Matloob, 2003). Considered one of the poorest countries in the Arab world, Yemen has gained some economic momentum within its oil industry since 2000 (CIA-The World Factbook, 2005).

PEOPLE OF YEMEN

The people of Yemen are termed *Yemenis* in the noun usage of the word and Yemeni in the adjective form. The population of Yemen is approximately 20,727,063 with a population growth rate of 3.45% and a 0% migration rate to the region (CIA-The World Factbook, 2005; National Information Center, 2005). The life expectancy for those born in Yemen is 61.75 years on average, with men having a shorter (59.89 years) life span than women (63.71 years). A small percentage of the Yemeni population (2.7%) is comprised of people 65 years of age or older. In addition to short life expectancy, the infant mortality rate of 61.5 deaths/1,000 live births is high, with baby boys (66.26 deaths/1,000 live births) experiencing higher mortality rates than girls (56.49 deaths/1,000 live births). The average fertility rate in Yemen is 6.67 children born per woman. The average size of a family in Yemen is 7.4 members with approximately 3.1 members sharing one room.

Whereas the ethnic groups living in Yemen are predominately Arab, African Arabs, South Asians, and Europeans also are included in the population. Most of the citizens are Muslim (Sunni and Shi'a), although Jewish, Christian, and Hindu religions also are practiced. The national language of Yemen is Arabic. Approximately 50% of the total population is literate according to the definition of people older than the age of 15 being able to read and write. The majority of the men (71%) in Yemen are literate, compared to 30% of the women. On average,

71% of boys and 37.5% of girls between the ages of 6 to 15 attend school (CIA-The World Factbook, 2005; National Information Center, 2005).

LEAD POISONING IN YEMEN

Because Yemen is not an industrialized nation, is more rural, and less densely populated, there are fewer sources of lead contamination. However, contamination from insecticides, fertilizers, and polluted water could contribute to high levels of environmental lead and other heavy metals in food products. Some examples of foods grown in Yemen that have been tested and found to have levels of environmental lead and other heavy metals include khat (a plant whose leaves and stem tips are chewed for their stimulating effects), lettuce, parsley, cabbage, leek, radish, and watercress (Matloob, 2003). Among these plants, khat is used by many Yemeni men (80%), women (7% to 10%), and juveniles (percentage unknown). The average daily intake of khat is approximately 100 g to 500 g. These amounts of khat have 23.6 µg to 118.0 µg of environmental lead respectively. Although these levels of lead alone do not exceed the recommended guidelines for safe ingestion of environmental lead exposure (3.5 to 4.0 µg/kg body mass), if other dietary or environmental doses of lead are consumed, the combined levels of lead may become elevated in the blood leading to neurological and biochemical problems especially for children (Matloob, 2003).

IMMIGRATION TO THE UNITED STATES

According to Al-Ashwal (1997), the Yemenis began their emigration to the United States in the 1860s after the opening of the Suez Canal. Many people at that time entered America as illegal aliens stowing away on ships and then blending with the existing Lebanese or Palestinian Arab communities. During the mid-1970s, the United States experienced an increase in the number of Yemeni settlers requesting visas for themselves and family members. A host of reasons have been given to explain why many Yemeni people came to America (e.g., find work, save money, and return to Yemen; escape religious persecution in Yemen; gain religious freedom; gain financial independence; etc.). The areas in the United States with the largest numbers of Yemeni immigrants include Detroit, Michigan; Buffalo, New York; and Fresno, San Francisco, Oakland, and Bakersfield, California. Detroit attracted Yemeni immigrants because of available jobs in the automotive industry, whereas Buffalo offered work in the steel factories. California offered work in agricultural and farming that led to establishment and ownership of grocery businesses.

According to the *Yemen Times Newspaper*, Yemeni immigrants tend to be more of sojourners than settlers (Al-Ashwal, 1997). For the most part, Yemeni men come to the United States seeking work, stay for a few years to earn money for their families in Yemen, and then return to their homeland to purchase property and settle. For those who chose to settle in the United States, the desire to remain true to their Yemen cultural beliefs is very strong. The Yemenis tend to be conservative, especially in the practice of their religion and traditions, resisting assimilation into the liberal American culture (Al-Ashwal, 1997).

YEMENI CULTURE

Family cohesiveness is the most important cultural institution among the Yemenis, whereas individualization is the strength of American culture. It is common to find several generations of one Yemeni family residing in the same house or in the same close-knit neighborhoods both in Yemen and the United States (Lynch & Hanson, 1998). The father, as the head of the household, is the mediator between the outside world and his family. On many occasions, he is the sole translator and decision maker for the information that comes in and out of the family circle from strangers in the Western world. Because Yemeni women have little contact with

the world outside of their extended family, their role is more concentrated on child and home care.

Culturally, Yemeni women are responsible for raising the children and keeping the home. Raising and bearing children in Yemen is held in high regard. For example, the relationship of the wife with her husband in Yemen is not deemed secure until she has delivered a child, particularly a boy that can carry on the family name (Al-Oballi Kridli, 2002). The greater number of children the wife delivers, especially boys, the stronger her place with her husband and in the family. In Yemen, family pressure is applied to the wife to have large numbers of children because of the high child mortality rate.

Yemeni men have a strong work ethic, which includes working long hours and multiple jobs to ensure the financial stability of the family. In America, Yemeni women are dependent on their husband because they are not familiar with the culture or the English language. The Yemeni women in the present study were illiterate in both the English and Arabic languages. Because of the cultural and language barrier, many Yemeni women in the United States depend on their husbands or other male family members to make family decisions that otherwise might have been controlled by the wife and mother (i.e., seeking health care for children and themselves, enrollment of children in school, safe and acceptable extracurricular activities for the children, etc.).

Many Yemeni women in America remain deeply rooted in their home culture and sometimes use home remedies to cure diseases. Some women hold close ties to other women in their neighborhoods, consulting the local folk healer for spiritual cures, rather than consulting Western health care providers (Kulwicki, 1996; Laffrey, Meleis, Lipson, Solomon, & Omidian, 1989). Some women also consult with family members in the Middle East for child health problems (Kulwicki, 1996; Laffrey, et al. 1989; May, 1992). The rationale for seeking spiritual healers is that Yemeni women are very private and expect reciprocal communication with health care providers. American physicians typically do not disclose personal information to patients as a means of establishing a professional relationship with their patients. Yemeni people traditionally seek treatment for acute illnesses, expecting rapid responses to treatment. If a Western health care provider is consulted and the illness persists, Yemenis do not hesitate to seek a second opinion or spiritual healer (Laffrey, et al., 1989).

YEMENI FAMILY STRUCTURE

The following cases encountered by the outreach team illustrate the family structure and cultural norms of Yemeni mothers. The outreach teams included four individuals: a female physician, a female nurse practitioner, a female translator, and a male translator. The four members of the team were divided into two separate teams: the female physician and male translator and the nurse practitioner and the female translator.

Family 1

On knocking on the door of the first family, the mother answered the door and was accompanied by two small children peeking out of the front window. The mother was greeted by the female translator, who verbally translated the importance of child lead testing and asked if she would allow her children to be tested. The mother immediately went back into the home and asked her husband to make the decision regarding the lead testing of the children. The husband spoke with the translator briefly and was unsure about agreeing to the testing. The husband then called the local Imam for consultation. The Imam confirmed and reassured the father that lead testing was important for the children and that he had given approval to the team to canvas and test children in the neighborhood. After the local Imam confirmed the legitimacy of the project, the father consented to the testing.

Family 2

The female physician and male translator visited a second family. The physician knocked on the door and three children appeared in the window, but no one answered the door. The female translator was asked to come to the house, after which the mother answered the door. The information was translated, but the mother would not allow the team into the home because a male family member was not present in the home. The mother explained to the translators that other men outside the family were not allowed in the family home without the permission of a male family member. The team determined the time when a male family member (husband) would be home and returned at that time to complete the testing.

Family 3

The mother and children in this home were present when the female members of the outreach team approached the door. After the translator explained the purpose of the visit, the mother called the father on the phone to gain permission to test the children in his absence. Although the female team members were allowed to test the children, the male translator was not allowed in the home. He waited outside during the time the team was obtaining the venous samples from the children.

In addition to testing the children in this home, children in the flat upstairs were tested because they were members of the same family. Following receipt of consent from any male family member, the testing could be completed with his children as well as any other children in the extended family as well. This mother then telephoned other family members in the neighborhood and told them about the testing and how her husband consented to the testing. These events lead to more families consulting with one another and allowing the outreach team to test the children. The mother even provided the outreach team with addresses of families who were willing to have their children tested. By this time, boys in the neighborhood would approach team members on the street and direct them to other homes that had children who needed testing.

The families presented in the three examples were typical of those encountered in the neighborhood. It is culturally acceptable and considered the norm to have a patriarchal-dominant family. Adult males were needed to provide approval for testing the children in the family for lead poisoning. In some cases, the Imam had to be contacted for additional assurances prior to the male giving permission for the family to participate in the project. The Yemeni culture depends heavily on informal channels of support such as extended family, religious leaders, and community leaders giving advice and guidance; therefore, it should not be expected that these collective families would readily accept or expect support from formal channels (e.g., hospitals, doctors, nurses, government agencies). Because Yemeni men are concerned about family honor and dignity, they assume the responsibility to protect their families from the threat of outsiders' influence. Most wives encountered in this study spoke only Arabic. All of the families had recently immigrated to the United States (less than 5 years), and the younger children were the first generation born in America. So, although the role of child rearing is primarily the work of the women in this culture, the lack of education in spoken English and contact with the outside world acted as barriers to women making health care decisions for their children.

SETTING: THE TARGET COMMUNITY

The neighborhood chosen for this effort consisted of a census tract located on the east side of Detroit. According to the 2000 Census, approximately 90% of the population was estimated to have either newly or recently emigrated from Yemen. According to the Michigan Department of Community Health (2005), 24% of children younger than 6 years of age in the

city of Detroit had been screened for lead poisoning in 2003. The Michigan Department of Community Health recommends that universal screening should occur if more than 27% of the housing stock in a neighborhood was built prior to 1978. Eighty percent of the housing in the targeted neighborhood had been built before 1950; therefore, universal screening was recommended.

Housing in this neighborhood consisted primarily of one-and two-family homes on narrow lots. The immediate neighborhood was home to two Arabic-language grocery stores, a mosque, a charter school, and a community service organization. The outreach efforts took place during the course of 4 days in August of 2004. This project was an exploratory effort to screen and treat immigrant Yemeni children who were at high risk for lead poisoning.

COMMUNITY OUTREACH METHODS

The Children's Hospital of Michigan CATCH (Community Access to Child Health) School Mobile Health Center initiated a community outreach project to screen children in a Yemeni neighborhood in Detroit. The Detroit Department of Health and Wellness analyzed the lead levels of the blood samples taken from the children included in the project.

Two community organizers, one male and one female (both of Arabic speaking background and well acquainted with local community leaders) provided information to the community about the importance of lead screening and proposed lead screening efforts. In addition to securing the consent of the local Imam and other community leaders, information sessions were held at the mosque. Arabic language posters were placed at both grocery stores as well as at the mosque to advertise the lead-screening event. On the weekend prior to the screening effort, flyers were distributed to each household in the neighborhood. Team members participating in the actual screening were careful to dress conservatively, females wearing long dresses or caftans and the male wearing a suit. However, only the Arabic speaking woman on the team covered her head with a scarf. The physician and nurse practitioner were clearly identifiable, wearing white lab coats with identification badges over their clothes. Prior to beginning the data collection phase of the study, approval was obtained from the Wayne State University Human Investigation Committee.

LEAD SCREENING TECHNIQUES

Two teams consisting of either a female nurse practitioner or female physician from Children's Hospital of Michigan CATCH School Mobile Health Center and one of the translators outfitted with phlebotomy equipment and coolers, canvassed the neighborhood, systematically approaching houses on opposite sides of the street. The translator for each team took the lead in knocking on doors and explaining the screening project to adults in each household. The translator completed demographic information as provided orally by the parents. Parents were asked to sign informed consent forms before drawing blood from each eligible child. The informed consent form explained the project in both English and Arabic and a copy of this consent was given to the parents to keep for their records. As part of the consent, parents were asked to provide permission for release of lead results to both Children's Hospital of Michigan, as well as to the translators.

Children's blood lead levels were screened by obtaining venous blood sampling using the standard aseptic technique. If a venous sample could not be obtained, a finger stick capillary sample was drawn. Lead samples were transported to the Detroit Department of Health and Wellness Promotion (DHWP, formerly Detroit Health Department) for sample analysis via graphite furnace atomic absorption spectrometry. At the end of the door-to-door lead screening, team members met to debrief about their experiences and lessons learned. These comments were recorded in field notes.

RESULTS

Results of the blood sample analyses were reported by DHWP to the CATCH School Mobile Health Center. These results were sent to the translators who completed Arabic language result letters for each child's family. The translators also contacted each family who had a child with an elevated blood lead level of 10 µg/dl or higher and provided additional information about intervention and treatment options. In addition, an English-speaking public health nurse from DHWP visited each of the families with children who had elevated blood lead levels to provide additional information about lead poisoning prevention and intervention.

A total of 250 homes were canvassed and contact was established with families with children younger than 7 in 100 homes. Neighbors helped provide information about which homes had children younger than 7 years old, accelerating the canvassing procedure. Participation in screening was high, with more than 90% of parents consenting to have their children tested. Of the 112 samples that were obtained, 109 (97%) were venous samples and 3 (3%) were capillary samples. The majority of tested children were between 1 and 2 years of age (37.5%), with the second largest group consisting of children aged 3 or 4 (31.5%). The percentage of girls tested was 51.8%, whereas boys comprised (48.2%) of the sample, indicating that the sample was relatively equally representative of both genders. Of the 112 samples, 7 (6.2%) had blood lead levels greater than or equal to 10 µg/dL, with no samples greater than 16 µg/dL. Among the children with elevated blood lead levels, 5 (4.5%) were newly diagnosed as lead poisoned. Two (1.8%) children previously had been diagnosed as lead poisoned, with their parents requesting follow-up screening on the days of the outreach. Children newly diagnosed with lead poisoning were treated by a pediatrician at Children's Hospital of Michigan and follow-up has been ongoing, with the hospital and DHWP working collaboratively with those children who were recently and previously diagnosed (Table 1).

DISCUSSION

Debriefing of team members included enumeration of cultural and ethnic practices that the English-only team members may have had knowledge of prior to the event, but with which they had no or limited direct experience. These experiences included heightened awareness of the important role that male family members and community leaders play in determining participation in health events. Thus, some women, if they were home alone with their children and had not heard about the lead screening outreach, contacted their husbands or other male family members prior to allowing their children to participate. Because most of the Yemeni mothers were both illiterate in English and their native Arabic language, they may have been unaware of the information regarding the screening presented on the flyers that had been posted prior to the outreach effort.

The father of the first family that was screened called the local Imam to confirm that this screening effort was legitimate prior to consenting. The local Imam showed support for the screening by talking with the health care team and discussing their presence with the neighbors at different times during the day.

When knocking on doors, team members found that it was important to show that a female was present as part of the team. For the team consisting of the male translator and a female physician, the translator first knocked on the door and then stepped back next to the female physician to reassure any women in the household that everything was safe. In some situations, no one would answer the door although children were clearly visible (peeking out of the windows), until the Arabic speaking female translator came over and called for an adult. In these situations, inevitably only women (and their children), but no men, were present in the

household. In addition, only female team members were allowed in the house if a male family member was not present.

Team members were impressed by the strong sense of community that permeated the neighborhood. At times, mothers would call other mothers, who were either relatives or friends, to tell them to bring their children from next-door or upstairs to be screened. Young teens, mostly boys, offered to assist the team for one or two blocks at a time, identifying homes that were inhabited by families with young children. On several occasions, neighbors stopped the team on the street to insure that their homes were also on the list of homes to be visited. The mothers were polite and hospitable to the team, and in many cases offered them juice and water. Because of the strong community interest, additional days were scheduled to complete the canvassing of the neighborhood. The daily call to prayer could be heard throughout the neighborhood and screening was halted during this time to observe this important part of the Yemeni culture.

CONCLUSION

Successful outreach into an immigrant neighborhood is possible but requires careful preparation by culturally knowledgeable organizers who are willing to spend the time necessary to lay the groundwork. The use of known and well-respected Arabic-speaking Yemeni from this population is important in gaining entry into the community and establishing trusting relationships. Health care providers and researchers must respect the cultural and religious values of these individuals and ask the local leaders for their thoughts and approval before embarking on health screening within the community. Health care providers and researchers should remember that gender plays a substantial role in this community and that the men in these families are the ultimate decision makers. When conducting community-based outreach, the women in the health care team should adhere to the traditions of dress and modesty practiced by the Yemeni women to show respect for the families. Outreach teams should always recognize the importance and power of the local Imam and stop all activities during the observed daily call to prayer. The male community leader has an ever-important role in discussing the project with the Imam and fathers in the community to gain their approval. Once approval has been obtained, it can be beneficial to have community leaders, especially women from the community, who can convey the importance of the project and aid in gaining trust from the mothers in the community, act as translators. The success of this project could not have been accomplished without the help of a local Yemeni man and woman who helped organize the project, setting up meetings with the local religious leader (Imam), translating health related materials, distributing flyers, and talking with the families at the local mosque prior to beginning the project.

Future projects are currently under way at Children's Hospital of Michigan to expand these efforts. The Children's Hospital of Michigan CATCH School Mobile Health Center in cooperation with Clear Corp (an environmental lead abatement program) have held lead screening fairs at local elementary schools with high populations of Arabic children. Plans are under way to continue this work by holding more lead screenings within the local Arabic communities in places that the people have some level of trust and comfort (i.e., community centers, local mosques, etc.) using both male and female leaders in the Arabic community.

Health care providers must reach out into the community and partner with both male and female leaders to show their commitment to the community and provide care to vulnerable populations at risk for health disparities. Community-based care can be an effective way to get care to those who need it and gain the trust of those who may otherwise go undiagnosed and untreated for illnesses. Health care teams must recognize the importance of the mother in the Yemeni family structure. Although Yemeni mothers hold the responsibility for the health and well-being of

the children, some of that responsibility is diminished here in America because of language and cultural differences. Because newly emigrated Yemeni mothers may not be familiar or comfortable with Western health care, some responsibilities for child health care decisions are deferred to the father. Recognizing and respecting gender differences, expectations, and culture of the Yemenis are necessary to provide high quality, non-threatening, appropriate health care to immigrant populations in need.

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TABLE 1**Demographic Characteristics of the Yemeni Children**

Demographic Characteristics (N = 112)	n	%
Age of child		
Younger than 1 year	8	7.1
1 to 2	42	37.5
3 to 4	35	31.3
5 to 6	23	20.5
7 years or older	1	0.9
Age unknown	3	2.7
Gender		
Male	54	48.2
Female	58	51.8
Venous sample		
Yes	109	97.0
No	3	3.0
Lead level		
Less than 10ug/dl	104	92.9
10ug/dl or greater	7	6.2
Quantity not sufficient	1	0.9