ORIGINAL ARTICLE

Pediatric care during a short-term medical mission to a Syrian refugee camp in Northern Jordan

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ABSTRACT

Introduction: The Syrian refugee crisis, now in its 6th year, has displaced millions. Refugees depend on support from host nation governments and humanitarian organizations like the Syrian American Medical Society (SAMS). We describe the delivery of pediatric care during a SAMS short-term medical mission to a refugee camp in Northern Jordan. **Methods:** The medical mission team encompassed dozens of specialties. Teams visited many sites, including the Zaatari refugee camp near the Syrian border. For this study, we gathered quantitative data from one physician who provided pediatric care and anecdotes from multiple SAMS physicians who provided pediatric care in Zaatari during the same time period. The physician supplying the quantitative data recorded age, diagnoses, and prescriptions for each patient. **Results:** The physician saw an average of 69 patients per day. Many of these were children aged 0–4 years. At least one diagnosis was recorded for 73.9% of patients, and at least one prescription was recorded for 85.5% of patients. **Discussion:** Most presenting complaints involved acute infectious illnesses, but these seemed preventable and related to refugees' living situations. Mental health assessment was difficult. Referrals proved important for evaluation and management of both acute and chronic conditions. For the short term, we emphasize the importance of effective liaison with refugee camp authorities and outside health-care organizations. For the long term, we recommend increased health-care infrastructure development and more emphasis on preventative care. **Conclusion:** With this study, we provide new quantitative and qualitative insights into pediatric care during a short-term medical mission to a Syrian refugee camp in Northern Jordan.

Key words: Jordan, medical mission, pediatrics, refugee camp, Syria, Syrian American Medical Society, Zaatari

INTRODUCTION

The Syrian refugee crisis, now in its 6th year, has displaced millions. Some fled south to Jordan, where Syrian refugees now constitute approximately 20% of the Jordanian population.[1] Most Syrian refugees in Jordan live in communities, but about 21% reside in formal refugee camps;[2] the largest of these is Zaatari, which currently houses nearly 80,000 refugees just south of the Syrian border.[3] The associated economic burden and public health strain are severe.[4,5] Refugees are dependent on support from host nation governments and humanitarian organizations like the Syrian American Medical Society (SAMS), which operates hundreds of health-care facilities within Syria while organizing short-term medical missions to the surrounding nations, including Jordan.[6]

Research helps nongovernmental organizations like SAMS set priorities, anticipate challenges, and deliver better health

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care. Refugee children are known to face a wide array of health problems,[7] but the literature provides limited insight into health care for Syrian refugees living in Jordan. Government reports suggest an increased prevalence for tuberculosis, measles, and cutaneous Leishmaniasis;[5] there has also been concern for potential resurgence of polio from an outbreak in neighboring Syria,[8] and drug-resistant bacterial infection in the war wounded.[9] More detailed public health studies suggest frequent care seeking for infectious diseases and chronic health problems, but these studies rely on self-report methodologies and focus on Syrians living in Jordanian communities instead of refugee camps.[10-13] While researchers have published observational descriptions of obstetric[14] and surgical[15] care in the Zaatari refugee camp, we are aware of no comparable studies describing health care for children – an extremely vulnerable segment of the Syrian refugee population. Scattered findings suggest that pediatric patients in Zaatari may have high rates of anemia[16,17] and an assortment of psychosocial problems related to isolation, anxiety, and depression,[18] with one study noting that attendance for school-age children in Zaatari is only 51%.[19] Other research details increasing rates of childhood marriage, which is customarily followed by early pregnancy, decreasing the likelihood of girls' continued pursuit of education.[20] One hospital-based study of heart disease covering children from both refugee camps and communities found children with life-threatening conditions suffering from preventable morbidity and mortality.[21] Another hospital-based study found that Syrian refugee neonates had lower weight and lower APGAR scores, compared to their Jordanian counterparts.[22]

Going forward, we anticipate ongoing need for provision of health care to vulnerable populations within and around Syria. For the benefit of future humanitarian volunteers to this region, we present the current study, which seeks to address some of the shortcomings of existing research by detailing the delivery of pediatric care during a short-term medical mission to the Zaatari refugee camp in Northern Jordan.

METHODS

In the beginning of 2017, SAMS completed a short-term medical mission to Jordan. The medical mission team included specialists in pediatrics, family practice, obstetrics and gynecology, emergency medicine, internal medicine, endocrinology, nephrology, hematology and oncology, cardiology, pulmonology, neurology, anesthesiology, orthopedic surgery, cardiothoracic surgery, ophthalmology, dermatology, dentistry, oral and maxillofacial surgery, and occupational therapy. These providers visited many sites, including the 5-year-old Zaatari refugee camp positioned just south of the Syrian border. The Zaatari camp currently houses nearly 80,000 displaced Syrians, and 27% of these are under the age of 18.[3] The refugees receive medical care from a variety of nongovernmental organizations operating within the Zaatari refugee camp, but they sometimes receive referrals for health care in Jordanian communities outside the camp.

SAMS physicians examined and treated patients in light structures containing a desk, a chair, an examination table, and possibly a space heater. Otherwise, physicians brought their own equipment, including stethoscopes, blood pressure cuffs, pulse oximeters, thermometers, glucometers, otoscopes, gloves, alcohol swabs, and other supplies. Pediatricians with limited Arabic proficiency worked with the assistance of SAMS translators, who were often volunteer medical students with a grasp of medical terminology and fluency in both Arabic and English. The clinic supplied medications. A permanent SAMS office in Amman provided critical logistical support, including equipment and transportation. Some families presented with small booklets serving as individual health records.

For this study, we gathered quantitative data from one physician and anecdotes from multiple SAMS physicians who provided pediatric care in Zaatari during the same time period. The physician supplying the quantitative data rotated through camp and community clinics throughout the medical mission, but spent 2 days in Zaatari, and during that time, she recorded age, diagnoses, and prescriptions for each patient. All patients were eligible, and there were no exclusion criteria. At the conclusion of the medical mission, we tabulated totals.

RESULTS

During the 2 days subject to quantitative data collection, the physician providing pediatric care saw 49 and 89 pediatric patients, for an average of 69 pediatric patients per day, with an average of <10 min per patient; Many of these were aged 0-4 years [Table 1]. At least one diagnosis was recorded for 102 (73.9%) patients, and these patients received an average of 1.2 diagnoses [Table 2]. At least one prescription was recorded for 118 (85.5%) patients, and these patients received an average of 1.7 prescriptions [Table 3]. With a primary diagnosis of upper respiratory infection (n = 57), 42 patients (73.6%) received a prescription for paracetamol and 19 patients (33.3%) received a prescription for dextromethorphan; only two of these patients (3.5%) received a prescription for amoxicillin.

Table 1: Age distribution of pediatric patients

Age (years)	Count (%)	95% CI (%)
0	28 (20.2)	14.4-27.7
1	13 (9.4)	5.5-15.4
2	14 (10.1)	6.1-16.3
3	9 (6.5)	3.4-11.9
4	13 (9.4)	5.5-15.4
5	11 (7.9)	4.5-13.7
6	13 (9.4)	5.5-15.4
7	6 (4.3)	2.0-9.1
8	5 (3.6)	1.5-8.2
9	3 (2.1)	0.7-6.1
10	7 (5.0)	2.4-10.1
11	6 (4.3)	2.0-9.1
12	6 (4.3)	2.0-9.1
13	3 (2.1)	0.7-6.1
14		
15	1 (0.7)	0.1-3.9
16		
17		
Total	138 (100.0)	

CI: Confidence interval

Table 2: Diagnosis frequency

Diagnosis	Count (%)	95% CI (%)
Upper respiratory tract infection	41 (31.7)	24.3-40.2
Bronchiolitis	14 (10.8)	6.5-17.3
Otitis	6 (4.6)	2.1-9.7
Pharyngitis	5 (3.8)	1.6-8.7
Tonsillitis	5 (3.8)	1.6-8.7
Dermatitis	4 (3.1)	1.2-7.7
Gastroesophageal reflux	4 (3.1)	1.2-7.7
Allergies	3 (2.3)	0.8-6.6
Asthma	3 (2.3)	0.8-6.6
Conjunctivitis	3 (2.3)	0.8-6.6
Eczema	3 (2.3)	0.8-6.6
Anemia	2 (1.5)	0.4-5.4
Bronchitis	2 (1.5)	0.4-5.4
Constipation	2 (1.5)	0.4-5.4
Diaper rash	2 (1.5)	0.4-5.4
Diarrhea	2 (1.5)	0.4-5.4
Gastroenteritis	2 (1.5)	0.4-5.4
Nasal congestion	2 (1.5)	0.4-5.4
Reactive airway disease	2 (1.5)	0.4-5.4
Teething	2 (1.5)	0.4-5.4
Urinary tract infection	2 (1.5)	0.4-5.4
Other	18 (13.9)	
Total	129 (100.0)	

CI: Confidence interval

DISCUSSION

The volume of pediatric patients in Zaatari was so high that we were able to gain some insight into distributions for age, diagnoses, and prescriptions, despite only collecting two days' worth of quantitative data from a single physician. However, it remains possible that our sample size was too small to detect or accurately characterize some categories of patients. Future research with larger sample sizes could address this statistical limitation, and more pediatricians are needed to reduce the number of patients seen daily by any particular provider. The presence of these additional physicians would also make it easier to confer on complicated cases and expedite patient care.

Infectious diseases dominated our quantitative data. This was somewhat consistent with prior public health research[10-13] and our collective observations. Diagnosis of upper respiratory infection was most common, but diagnoses of pharyngitis, tonsillitis, bronchitis, and otitis media also ranked highly. Most of these illnesses seemed preventable and related to refugees' living situations; for example, infections spread quickly among closely quartered members of the same family who shared all belongings and relied upon a limited supply of cleaning products and potable water. Such infectious diseases seemed to have worsened due to lack of early supportive care. Though most infections appeared viral, we also wondered about the prevalence of drug-resistant bacterial infection, given refugees' potential difficulty completing the prescribed courses of antibiotics. We were unable to culture samples and test for sensitivities, but these data may be available from other health-care and educational institutions in the region. We did not detect any instances of measles or polio, which are more common in this population,[5] but our sample size was small, and the sheer volume of patients frustrated attempts to investigate vaccination status. In the absence of records, we relied upon parental report. For patients who were not up to date on immunizations, a vaccination clinic may have been helpful. We also did not detect any instances of tuberculosis or cutaneous Leishmaniasis, which are more common in this population,[5,8] but this could also result from small sample size, and one author nonetheless diagnosed a case of cutaneous Leishmaniasis during a day spent practicing in a SAMS-supported community clinic outside the refugee camp. That patient received a referral for biopsy and dermatology consultation.

Chronic disease was uncommon in our dataset. However, we did encounter cases of anemia and cardiac murmur, consistent with prior research.[16,17,21] One anemia patient had findings consistent with thalassemia. Another patient presented with a growth hormone deficiency in need of medication. There were also instances of anatomic abnormalities, including a neonate with an anorectal malformation and a case of polydactyly that was not a presenting complaint. It was unclear whether the polydactyly resulted from a singular anomaly or a syndrome. Finally, the father of a patient with Turner syndrome expressed concern about impaired growth and amenorrhea in his 17-year-old daughter, and his lack of awareness about his daughter's condition seemed emblematic of a communication problem. Management of these kinds of conditions was infeasible within the context

Table 3: Prescription frequency

Prescription	Count (%)	95% CI (%)
Paracetamol	63 (30.2)	24.4-36.8
Amoxicillin	28 (13.4)	9.4-18.7
Dextromethorphan	22 (10.5)	7.0-15.5
Prednisolone	12 (5.7)	3.3-9.8
Hydrocortisone	8 (3.8)	1.9-7.4
Albuterol	6 (2.8)	1.3-6.1
Prednisone	6 (2.8)	1.3-6.1
Suction bulb	6 (2.8)	1.3-6.1
Vitamins	6 (2.8)	1.3-6.1
Diaper cream	5 (2.4)	1.0-5.5
Loratadine	4 (1.9)	0.7-4.8
Ranitidine	4 (1.9)	0.7-4.8
Sulfamethoxazole/trimethoprim	4 (1.9)	0.7-4.8
Acetaminophen	3 (1.4)	0.4-4.1
Deworming tablets	3 (1.4)	0.4-4.1
Erythromycin	3 (1.4)	0.4-4.1
Ketoconazole	2 (0.9)	0.2-3.4
Multivitamins	2 (0.9)	0.2-3.4
Oral electrolytes	2 (0.9)	0.2-3.4
Other	19 (9.1)	
Total	208 (100.0)	

CI: Confidence interval

of a short-term medical mission. Again, we referred patients to local clinics outside the refugee camp.

We were unable to obtain much data on the impact of trauma on our pediatric patients. For example, we did not see many patients presenting with injuries directly related to armed conflict (e.g., blunt or penetrating trauma, burns, or hearing loss), but this might have resulted from the length of time refugees had already spent living in the camp. Some children likely had posttraumatic stress disorder, with speech delays or secondary enuresis, but a number of factors complicated mental health assessment, including high patient volume, the presence of multiple family members within the room, and natural hesitancy to discuss extremely sensitive matters. This underscored the need for physicians to be skilled in expedient delivery of something akin to psychological first aid. We suspect that many patients and families would have benefited from long-term contact with mental health and social work teams.

For pediatricians considering this type of volunteer work, we suggest a customized packing list. Among other things, the list should include multiple thermometers, a battery-operated otoscope, a battery-operated scale, and a fingertip pulse oximeter, though these are difficult to use in unheated rooms where children's digits tend to be covered. A smartphone can function as a flashlight and a means of identifying prescriptions and consulting colleagues. We also suggest ear curettes, nebulizers, and ample supplies of amoxicillin, Augmentin, cefixime, antibiotic ointments, and steroid creams – preferably from a local pharmacy. Of course, for disposal, a proper sharps container is preferable to an empty water bottle. Simple laboratory testing kits can obviate the need for some referrals.

As mentioned above, referrals played important roles in both acute and chronic care. It is true that we treated many seemingly straightforward cases of upper respiratory tract infections, bronchiolitis, and otitis, but we also periodically encountered patients requiring imaging, laboratory testing, surgery, or specialty consultation that we were unable to provide, despite immense breadth and depth of expertise in our larger medical mission team. Such referrals became problematic for several reasons. For example, some patients were unable to pay for diagnostics or treatment unless these were provided by a relief organization, and both documentation and care coordination seemed to suffer when patients sought care from multiple governmental and nongovernmental organizations. Occasionally, patients secured funding from volunteers or crowdsourcing sites, but in these situations, it was difficult to determine whether funds were used most effectively, even with the best of intentions. In the short term, medical mission teams must liaison effectively with refugee camp authorities and outside health-care organizations; for this, we relied upon extensive planning by mission leadership and the permanent SAMS office in Jordan. Medical mission teams should also establish reliable funding sources and channels to support referrals, including contacts capable of determining and reporting on actual costs of consultation, imaging, transportation, medications, and additional funding needs. For example, during this medical mission, networking with a nurse in Zaatari yielded review by an office of the United Nations High Commissioner for Refugees, producing sustained funding for a complicated patient requiring multiple follow-up imaging studies and surgeries. In the long term, facilities within the camp could expand to accommodate a broader range of acute and chronic complaints, providing free basic laboratory testing and imaging. Of note, SAMS has recently begun construction of a new clinic within the refugee camp. In this context, we also suggest increased emphasis on preventative care, given the seemingly avoidable nature of many of our patients' illnesses and chronic conditions. This should include regular monitoring of growth and developmental milestones, as well as early intervention programs and efforts to increase access to resources such as formula, diapers, and iron-rich food. Any efforts at health, psychological, or social education need to consider multiple obstacles intrinsic to the refugee camp setting, including noise and crowding in the clinic area, cultural differences, language barriers, and possibly illiteracy. Hiring of local medical personnel could mitigate some of these challenges,

improve continuity of care, and ultimately empower refugee camp residents. We hope that future research examines these kinds of health-care transitions and interventions, especially considering that camps like these, once thought to be temporary, are now becoming permanent fixtures of the regional landscape.

In summary, our recommendations are:

- Expect very high patient volume per workday; use multiple pediatricians, if possible
- Plan on treating many seasonal concerns, such as upper respiratory tract infections during the winter and gastroenteritis, allergies, or rashes during the summer
- Prepare to expediently address psychological trauma that may be highly prevalent
- Anticipate modifications necessary due to cultural differences, language barriers, and possibly illiteracy
- Consider using volunteer translators who are medical students with a grasp of medical terminology and fluency in both Arabic and English
- Bring your own battery-operated examination and treatment equipment, as well as sharps containers and possibly laboratory testing kits
- Bring a cellphone and charger, and purchase cellular network access to identify prescriptions and communicate with colleagues
- Find or establish support services for mental health, physical therapy, occupational therapy, and speech therapy
- Develop solid contacts with refugee camp authorities and outside health-care organizations to facilitate referrals
- Establish reliable funding sources and channels to support referrals, including contacts capable of determining and reporting on actual costs of consultation, imaging, transportation, medications, and any additional funding needs
- Advocate for more preventative care, including growth monitoring and nutrition education, as well as psychosocial care and health-care infrastructure development, hiring local medical professionals when possible.

CONCLUSION

With this study, we provide new quantitative and qualitative insights into pediatric care during a short-term medical mission to a Syrian refugee camp in Northern Jordan. We detail the most common diagnoses and prescriptions, as well as practical considerations for any pediatricians considering similar volunteer work. In view of our findings, we emphasize the importance of both short- and long-term strategies for improving refugees' health care.

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Conflicts of interest

There are no conflicts of interest.

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