REVIEW ARTICLE

INFECTIOUS DISEASES OF AFGHAN IMMIGRANTS IN THE UNITED STATES: REVIEW OF PUBLISHED REPORTS

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Infectious diseases of immigrants may differ from patients born and resident in the same country, especially if immigrants from Africa or Asia live in Europe or North America. Because the available information is limited published reports of infections of Afghan immigrants in the United States and other countries were analysed. Four reports from the US and 15 reports from other countries were identified [7, (46.7%) Pakistan, 5 (33.3%) Iran, 1 (6.7%) United Kingdom, 1 (6.7%) Germany, 1 (6.7%) Israel)]. Reports from the US were case reports or case series of infections with gastro-intestinal parasites and *Mycobacterium tuberculosis* (1, 25%), *Echinococcus* species (2, 50%), and *Plasmodium vivax* (1, 25%). Reports from other countries were case reports, case series, or surveys and investigated infections with *Echinococcus* species (2, 13%), Hepatitis B virus (HBV) (1, 6.7%), *M. tuberculosis* (6, 40%), *P. falciparum* (1, 6.7%), *Leishmania tropica* (3, 20%), *Fasciola hepatica* (1, 6.7%), and *M. leprae* (1, 6.7%). The reports suggest that *Echinococcus* species and *L. tropica* infections can be encountered in Afghan immigrants in the US, and the frequency of a positive PPD (purified protein derivative) response or HBsAg test was increased. An infectious diseases database specific for the country of residence readily available to clinicians treating Afghan patients outside of Afghanistan may be useful.

Keywords: International Health, Immigrants, Afghanistan

INTRODUCTION

Infectious diseases of immigrants may differ from residents born and living in the same country, especially if immigrants from Africa or Asia live in Europe or North America.[1] Immigrants can continue to be at risk of developing infections affecting residents of their country or origin, e.g., immigrants from Asia or Africa in Europe or North America are more frequently infected with *Mycobacterium tuberculosis* than are patients born in Europe or North America.[2]

No database is available to clinicians that is collecting and presenting data systematically for infectious diseases of immigrants and refugees according to country of origin and country of residence of affected patients. Therefore, for this study published reports of infectious diseases of one ethnic group, Afghan immigrants, living in the US and other countries were chosen for analysis. The identified reports suggest that *Echinococcus* species and *Leishmania tropica* infections can be encountered in Afghan immigrants, and the frequency of positive PPD (purified protein derivative) response or positive HBsAg are increased in the US. An infectious diseases database specific for the country of current residence for immigrants from Afghanistan and other countries may be useful for clinicians.

METHODS

PubMed was searched for English language references published as of October 2009 using combinations of the following terms: 'Afghan', 'infection', 'case report', 'patient', 'refugee', 'immigrant'. Spelling variants of the search terms were included. Reports describing infections of Afghans living outside of Afghanistan were included, and case reports for children and adolescents were excluded.

RESULTS

Four case reports or case series from the US (Table-1) were identified and reported infections with gastro-intestinal parasites and *Mycobacterium tuberculosis* (1, 25%)[3], *Echinococcus* species (2, 50%)[4,5], and *Plasmodium vivax* (1, 25%)[6].

The most frequently identified stool parasites with microscopy of 59 Afghan refugees (Table-1), the majority had arrived to the US within less than 5 years, were *Ascaris lumbricoides* (5, 9%) and *Giardia lamblia* (5, 9%).[3] One case report of an Afghan patient with infection with *Echinococcus granulosis* described an initial presentation with an abdominal mass considered to be malignancy.[4] Of 59 studied Afghan refugees over 20 years, 97% had a positive PPD reaction.[3]

Fifteen reports from other countries (Table-2) were identified 7 (46.7%) Pakistan, 5 (33.3%) Iran, 1 (6.7%) United Kingdom, 1 (6.7%) Germany, and 1 (6.7%) Israel.

The reported infections were *Echinococcus* species 2 (13.3%), Hepatitis B virus 1 (6.7%), *M. tuberculosis* 5 (40%), *P. falciparum* 1 (6.7%), *Leishmania tropica* 3 (20%), *Fasciola hepatica* 1 (6.7%), and *M. leprae* 1 (6.7%).

In Pakistan one study reported 21 Afghans with hepatic hydatid echinococcosis[7] and in the UK one case report described one patient with a liver mass due to *Echinococcus multilocularis.*[8] When 903 Afghan

refugees in Pakistan (Table-2) were tested for chronic hepatitis 75 (8.3%) were HBsAg positive.[9]

Six reports of tuberculosis, 2 from Pakistan[10,11], 3 from Iran[12–14], and 1 from Germany[15] were identified. One-thousand cases of lymph node enlargement due to tuberculosis were reported in Afghan refugees in Pakistan.[10] Another study from Pakistan reported 23 Afghan refugees with bone tuberculosis.[11]

Three reports of *Leishmania tropica* infections from Pakistan were identified (Table-2). The studies were surveys of Afghan refugees with cutaneous leishmaniasis. Between 2.3% and 38% of Afghan refugees studied had skin lesions due to leishmaniasis.

One report from Iran described 12 leprosy patients one of which was an Afghan.[16]

Table-1: Summary of published reports of infectious diseases of Afghan immigrants living in the United States

Year and reference	Study type	Patients		Infection	Investigations	Management
		Number	Age, gender			
Gastrointestinal parasites						
1985[3]	Case series	59	38 (64%), male 21 (36%), female mean age 24 (6 months to 62 years)	5 (9%) *Ascaris lumbricoides* 5 (9%) *Giardia lamblia* 4 (7%) *Entamoeba histolytica*	Stool microscopy	NS
***Echinococcus* species**						
2009[4]	Case report	1	57, male	*E. granulosus* abdomen Preoperative diagnosis: malignancy	Histology of biopsy	Albendazole, Resection
2004[5]	Case report	1	71, male	*Echinococcus* species heart septum	Transthoracic and transesophageal echocardiogram	None (patient left care)
Mycobacterium tuberculosis						
1985[3]	Case series	59	38 (64%), male 21 (36%), female mean age 24 (6 months to 62 years)	*Mycobacterium tuberculosis* latent infection	PPD skin-testing: positive <20 years 59% >20 years 97%	NS
Plasmodium vivax						
1989[6]	Case report	1	28, male	*Plasmodium vivax*	Peripheral blood film	Chloroqunine and primaquine

Abbreviations: NS, not stated; PPD, purified protein derivative

DISCUSSION

In this article 19 published reports of infectious diseases in Afghan immigrants in the US and other countries were reviewed regarding information about infectious diseases of immigrants when living abroad. This medical information about Afghan and other immigrants can be useful for clinicians taking care of immigrants. For example, when providing care for Afghan immigrants in the US, testing of stool for ova and parasites should be considered especially after recent arrival to the US.[3] (Table-1).

Two case reports of infection with *Echinococcus* species in the US were identified (Table-1), one of which described a patient who was initially diagnosed having an abdominal malignancy.[4] In countries other than the US 21 patients with hepatic hydatid echinococcosis were reported from Pakistan and from the UK suggesting that echinococcosis of the liver and other organs in Afghans may be an underdiagnosed disease. *Echinococcus* species infection should be included into the differential diagnosis of e.g. lung and liver tumours of Afghan immigrants (Table-1 and 2).

According to one report[3] in the US (Table-1) nearly all Afghans were PPD positive and therefore *Mycobacterium tuberculosis* infection could be considered in Afghan patients presenting with lung disease, or kidney and bone mass lesions. Most tuberculosis reports are from outside of the US and from Pakistan and Iran, probably because of large numbers of Afghan refugees in Pakistan and Iran. Tuberculosis affecting lymph nodes and bone appears to be a major problem of refugees in Pakistan and Iran.[17]

No reports of *Strongyloides stercoralis* infections of Afghan immigrants in the US or elsewhere (Table-1 and 2) including Afghanistan were identified. Patients with this undiagnosed infection may develop dissemination following use of corticosteroids.[18]

Infections with *Leishmania major* and *tropica* are endemic in Afghanistan and 3 reports from Pakistan and no report from the US were identified. Perhaps the infection has not been described in published reports in the US because skin lesions may be small or disappear spontaneously after years[19], but clinicians should consider leishmaniasis in any Afghan patient with nodular or ulcerating skin lesions.

One survey from Pakistan detected a seropositivity of 8.3% for HBsAg as a test for chronic Hepatitis B, and therefore the possibility of chronic Hepatitis B should be considered in Afghan immigrants.

An important limitation of the collected data in this review is the time period of over 20 years studied

and the publication bias of case reports and series, which may especially report unusual presentations of infections.

Clinicians taking care of immigrant patients do not have easy access to information regarding what infections these patients develop when living abroad. The information in this study was collected during searches with PubMed, which may not be feasible as a timely point-of-care information tool for clinicians. An online current database may be useful where clinicians can obtain information about infectious diseases based on country of origin and country of residence of patients similar to existing travel medicine online databases (e.g., http://www.mdtravelhealth.com).

CONCLUSION

The published reports suggest that *Echinococcus* species and *Leishmania tropica* infections can be encountered in Afghan immigrants, and an increased number are PPD or HBsAg positive. A database specific for the current country of residence with epidemiological infectious diseases data readily available to clinicians treating Afghan immigrant patients outside of Afghanistan may be useful.

Table-2: Summary of published reports of infectious diseases of Afghan immigrants according to country of residence

Country Year	Study type	Patients		Infection	Investigations	Management
		Number	Age (year), gender			
***Echinococcus* species**						
Pakistan 2009[7]	Case series	106 (21, 19.8% Afghan)	mean age 34; 60 (56.6%), male	Hepatic hydatid echinococcosis	Abdominal ultrasound Antibody	Albendazole Percutaneous aspiration and instillation, Surgery
UK 2002[8]	Case report	1	67, male	*E. multilocularis* liver	Computer tomography MRI, Antigen	Albendazole Laparoscopic biopsy
Hepatitis B virus						
Pakistan 2006[9]	Survey	903	Age 0–>50	HBsAg serology	75 (8.3%)	NA
M. tuberculosis						
Pakistan 2002[10]	Case series	1000	10–30 years (72%), Male (45%) female (55%)	*M. tuberculosis* Peripheral lymph node	Histology of biopsy	NS
Iran 2007[12]	Case series	164	97 (59%) male, 67 (41%) female, mean age 34 year	*M. tuberculosis* Lung	124 (76%) standard 35 (21%) MDR Tb	NS
Germany 1995[15]	Case report	1	58, female	*M. tuberculosis* oesophagus Initial diagnosis: cancer	Histology and culture	Drug therapy
Iran 2007[13]	Case series	371	208 (56%), male 163 (44%), female Mean age 27.6	*M. tuberculosis* 278 (74.9%) pulmonary 93 (25.1%) extra-pulmonary	Sputum microscopy and culture Chest radiograph	NS
Pakistan 1992[11]	Case series	80	46 (57.5%), females 34 (42.5%), males 23 (28.7%) Afghan refugees	*M. tuberculosis* bone 17 (21.2% vertebrae) 12 (15%) knee	Histology and culture of biopsy	Drug therapy surgery
Iran 2006[14]	Case series	668	39.8 mean age 312 (46.7%) female 356 (53.2%), male	*M. tuberculosis* 613 (91.7%) pulmonary 34 (5.0%) extra-pulmonary	Sputum and biopsy culture and microscopy Spoligotyping	Drug therapy
Plasmodium falciparum						
Iran 1986[20]	Case reports	2	18, male 25, male	*P. falciparum*	Chloroquine-resistant	Quinine and sulphadiazine-pyrimethamine
Leishmania tropica						
Pakistan 2004[21]	Survey	19 918	refugee	Cutaneous leishmaniasis	Interview Smear microscopy	NS
Pakistan 2004[19]	Epidemiology study	21046	refugees	Cutaneous leishmaniasis	Interview	NS
Pakistan 1999[22]	Survey	9200	refugees	Cutaneous leishmaniasis	Smear microscopy, culture, PCR	NS
Fasciola hepatica						
Israel 1981[23]	Case report	1	65-year-old female	*F. hepatica* common bile duct	Microscopy	Cholecystectomy Emetine Worm extraction
Mycobacterium leprae						
Iran 2004[16]	Cross-survey	12	11 (91.6%), male 1 (8.3%), female Mean age 48.5 1 Afghan patient	*M. leprae*	Clinical examination and histology	Drug therapy

Abbreviations: PCR, polymerase chain reaction; NA, not applicable; NS, not stated, MRI, magnetic resonance imaging; MDR TB, multi-drug resistant tuberculosis

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