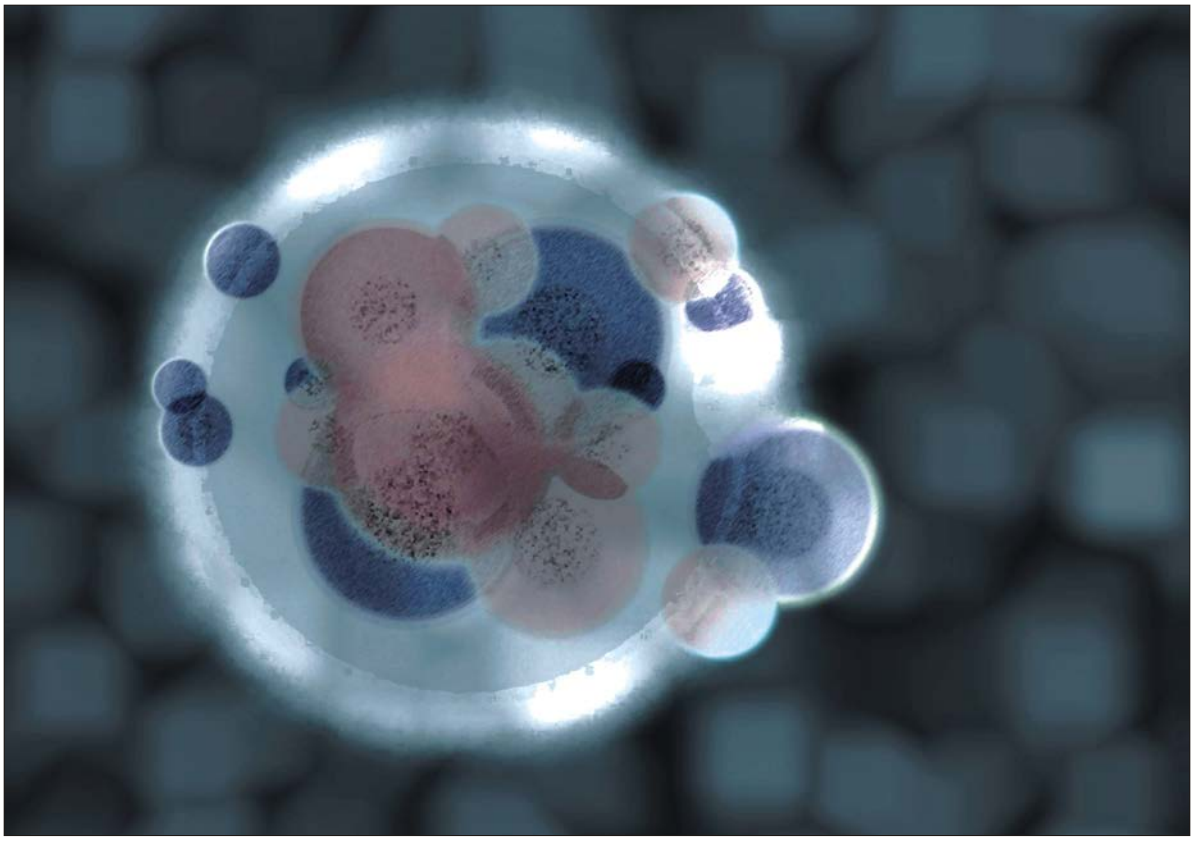

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Tuberculosis in the Afghan Immigrant in Kerman Province of Iran

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Abstract: This study was performed to examine the prevalence of tuberculosis (TB) in Afghan immigrants in Kerman province of Iran. Total of three hundred samples were collected from Afghan immigrants and were analyzed by PCR using primers corresponding to the recF gene of *M. tuberculosis* complex. Present results showed that *Mycobacterium tuberculosis* DNA was present in 36 out of 300 (12%) sputum samples. Thirty-two out of 36 patients were women (88%) and 4 cases were men (12%). Present results demonstrated that these immigrants are high risk for TB infection and surprisingly women are more affected. Therefore, a wide variety of strategies are needed for prevention and treatment of TB in this population.

Key words: Afghan immigrants, *Mycobacterium tuberculosis*

INTRODUCTION

Tuberculosis (TB) is one of the oldest diseases which are known to affect humans. The disease usually affects the lungs and in nearly one-third of cases other organs are also involved (Lolekha *et al*., 2008). TB was expected to be eradicated by the end of the previous century; however, an increasing incidence of tuberculosis in many parts of the world led to re-newed interests on the disease (Baker *et al*., 2008). The burden of TB on mankind continues to be enormous, one-third of the world's population are infected with the bacillus, the vast majority of which resides in developing countries like Iran and Afghanistan (Ramazanzadeh *et al*., 2006). TB is a chronic disease that commonly affects the lower socio-economic classes. The TB potential risk factors include overcrowding, malnourishment, poverty, alcoholism, unemployment, political instability and specially infecting with HIV (Ramazanzadeh *et al*., 2006; Boraschi *et al*., 2008). Moreover, Africa and South-east of Asia have the largest number of TB cases and these days condition has been worsened by the HIV epidemy (Ramazanzadeh *et al*., 2006; Boraschi *et al*., 2008). However, the prevalence of the disease in Asia was high at the end of the 19th century it also remains untill today (Wanchu *et al*., 2008). Approximately 90 million new cases of TB have been detected worldwide during the last decade (Fattorini *et al*., 2007). The Eastern Mediterranean region is one of four regions with increased global rates. This rate (one per 100,000 population) increased by 15.1% from the 1984-1986 and 1989-1991 periods (WHO, 1993). Although there are many studies regarding TB prevalence in some countries (Ramazanzadeh *et al*., 2006; Boraschi *et al*., 2008), there is not any study about the prevalence of TB on the Afghanian immigrant in Iran. Hence, this study was aimed to determine the prevalence of TB in this population.

MATERIALS AND METHODS

This is a cross sectional study which was performed in Department of Microbiology and Immunology, Rafsanjan University of Medical Sciences, Rafsanjan, Iran during June 2006-March 2007.

Subjects: Three hundred samples were collected from 300 Afghan immigrants (138 female and 162 male) with an average age of 15-60 year that reside in Imam Khomeini camp in Kerman province in Iran. None of studied cases were smoker and they were not suffering from a known disease. Sputum samples were collected from these populations and stored at -20°C for a maximum of 2 months or at -70°C for further application.

DNA extraction: TB DNA was purified from 100 μL of sputum samples. Briefly, each serum sample was incubated in 100 μL proteinase K (200 μg mL^{-1}) and 1000 μL lysis solution (Cinnagen com, Iran) at 72°C for 60 min and then cooled at 4°C for 5 min. After phenol/chloroform standard method extraction, the bacterial DNA was precipitated with ethanol and the pellet was resolved in DNase free, daionized water and stored at -20°C.

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PCR and gel electrophoresis: PCR was performed in 25 μL of final volume in the following conditions: 10 mM Tris-HCl pH 8.5, 50 mM KCl, 0.1% gelatin, 0.2 mM of each dNTP, 1.5 mM $MgCl_2$, 1 μM of each primer, 2.5 U of Taq polymerase and 2 μL of prepared DNA. The sequence of forward primer was 5'-GTCATTTTGGGCTGCGTGAC-3' and the sequence of reverse primer was 5'-CGGADGGCGTTATTGAAGTC-3'. These primers derived from gene recF and amplify a 500 bp of the TB genome. PCR cycling conditions were 94°C for 1 min, 65°C for 1 min, 72°C for 2 min, for 35 cycles. For the analysis of PCR amplification, 10 μL of the amplified DNA were run on a 2% agarose gel after adding 4 μL loading dye. The presence of a 500 bp fragment indicated positive result. Ladder was also run on the gels to estimate the molecular weights of DNA fragments in the gel.

Statistical analysis: Data were analyzed by SPSS statistical software package version 11.0 (SPSS Inc., Chicago IL).

RESULTS AND DISCUSSION

Present results showed that *M. tuberculosis* (TB) DNA was present in 36 cases of 300 (12%) sputum samples. There were 4 male and 32 female subjects in the TB-DNA positive group, with an average age of 54 years and 30 in TB negative patients. Therefore, there is a significant difference between age of studied population ($p<0.05$) (Table 1).

Thirty two out of 36 patients were women (88%) and 4 cases were men (12%). Therefore, present results showed that 2.46% of male were TB-DNA positive but 23.18% of woman were TB-DNA positive. Based on our results there is a significant difference between two groups ($p<0.05$). Only two patients had tuberculosis symptoms such as cough. Present results also showed that 80% of TB-DNA positive patients were new Afghan immigrants.

This study evaluated epidemiological aspects of tuberculosis in Afghan immigrants resident in Kerman province, situated in the south-east of Iran. Present results showed that there is high prevalence of TB in this population. It could be due to many socioeconomic problems such as poverty, unemployment, malnourishment and common prevalence of addiction in this population, as the disease is closely linked to malnutrition and poverty which makes the outbreak of tuberculosis more likely in the impoverished population (Baker *et al.*, 2008). New immigration from high prevalence country like Afghanistan (Hossein *et al.*, 2005) is probably another important factor for high prevalence of

Table 1: Average age of *M. tuberculosis* infected and none infected individuals

Peak	At least	Mean±SD	Average age (year)	Plurality	TB-DNA
40	10	30.33±9.64	30.3	264	Negative
65	35	54.30±9.60	54.3	36	Positive
65	10	42.30±12	42.3	300	Total

TB in this group. Diagnosis and treatment of the disease is not costly in Iran, so this can probably be a reason behind the large number of TB-affected people in this population, because a number of Afghans enter the country to benefit from free treatment. Because almost two third of the world's tuberculosis infected population resides in Asia, the relatively recent increases of HIV infection in Asian communities may lead large increases in HIV-associated tuberculosis (Boraschi *et al.*, 2008). In order to achieve the global aims for diagnosis and treatment of TB it is essential to improve case detection rates, particularly through involving all health care providers in DOTS (Directly Observed Treatment Short Course) activities (Hossein *et al.*, 2005). Present study showed that the rate of TB in Afghan immigrant population was significantly higher than Iranian population (Hossein *et al.*, 2005). According to the vaccination program in Iran, all Iranian children should receive vaccine for BCG at birth and also in 9th months after birth; however, Afghanistan has not any precise vaccination program for Afghan population in Afghanistan but Afghan children are getting vaccination by Iranian health system. Present results also showed that almost all patients aged 35 to 65 which have not received vaccine in childhood. So, it could be suggested that the BCG vaccination program apply for all Afghan population as Iranian population. The most affected age group in our study was over 65 years which is similar to other low TB incidence countries (Ramazanzadeh *et al.*, 2006); other studied showed that the age group between 16 and 35 years is the most affected group in Nigeria (Itah and Udofia, 2005) and the age group between 20 and 40 years is the most affected group in China (Chamla *et al.*, 2004). In agreement with present study a previous study performed by Hossein *et al.* (2005) showed that comparing of the results of smear positive pulmonary TB between Iranian and refugee patients in Iranian population was most seen in 10 years older (Hossein *et al.*, 2005). They stated that it is may be due to a better care of Iranian population about their health problems, higher socioeconomic classes to cope with the expenditure of their disease and more compliances to follow treatment and to accept DOTS strategy (Hossein *et al.*, 2005). Present results also demonstrated that women are more at risk in this population. It is probably because of different sexual hormones (Deepak *et al.*, 2008), they are always morally at home and

are not exposed to sunlight and it may possibly affect their immune system (Imazeki *et al*., 2006). As we noted Afghan women used to apply lots of cosmetics and hair dye which also may affect their immune system and also treatment the disease. Afghan immigrants do not used standard toilet and it may increase the risk of infectious disease including TB. Finally improvement of socioeconomic conditions and better access to health care like developed countries and strict control of migration process could provide the long solution.

CONCLUSION

Based on present findings, planning of a vaccination program for Afghan immigrants is suggested due to the fact that almost a big proportion of careers and patients are who newly entered cases from Afghanistan to Iran. Taliban war probably worsened the Afghanistan health situation, therefore it is suggested that world health organization (WHO, 1993) and other organizations (e.g., united nation organization) establish vaccination programs for Afghan people which are living inside this country.

It is of note that established good quality toilets for Afghan immigrants to use are essential.

Planning educational and informational programs regarding infectious diseases including TB and sexual activities.

REFERENCES

Baker, M., D. Das, K. Venugopal and P. Howden-Chapman, 2008. Tuberculosis associated with household crowding in a developed country. J. Epidemiol. Comm. Health, 62: 715-721.

Boraschi, D., A.M. Abebe, A. Aseffa, F. Chiodi and J. Chisi *et al*., 2008. Immunity against HIV/AIDS, malaria and tuberculosis during co-infections with neglected infectious diseases: Recommendations for the European Union Research Priorities. PLoS Negl Trop. Dis., 25: 255-255.

Chanila, D.D., S. Nie and Q. Duan, 2004. Retrospective descriptive study of adult tuberculosis in Wuhan, China. Int. J. Tuberc. Lung. Dis., 8: 730-736.

Deepak, P., S. Kumar and A. Acharya, 2008. Gender dichotomy in antibody response in a T-cell lymphoma: Involvement of IL-13 and gonadal hormones. Am. J. Reprod. Immunol., 59: 127-138.

Fattorini, L., G.B. Migliori and A. Cassone, 2007. Extensively drug-resistant (XDR) tuberculosis: An old and new threat. Ann. Ist Super Sanita, 43: 317-319.

Hossein, A.K, R. Nima, R.B. Gholam, A.D. Mohammad, S. Khalil, T. Amir and M. Maryani, 2005. Epidemiology of tuberculosis in the southeastern Iran. Eur. J. Epidemiol., 20: 879-883.

Imazeki, I., J. Matsuzaki, K. Tsuji and T. Nishimura, 2006. Immunomodulating effect of vitamin D3 derivatives on type-1 cellular immunity. Biomed. Res., 27: 1-9.

Itah, A.Y. and S.M. Udofia, 2005. Epidemiology and endemicity of pulmonary tuberculosis (PTB) in Southeastern Nigeria. Southeast Asian J. Trop. Med. Public Health, 36: 317-323.

Lolekha, R., A. Anuwatnonthakate, S. Nateniyom, S. Sumnapun and N. Yanada *et al*., 2008. Childhood TB epidemiology and treatment outcomes in Thailand: A TB active surveillance network, 2004-2006. BMC Infect. Dis., 8: 94-94.

Ramazanzadeh, R., P. Farnia, N. Amirmozafari, F. Ghazi and Z. Ghadertotonchi *et al*., 2006. Comparison between molecular epidemiology, geographical regions and drug resistance in *Mycobacterium tuberculosis* strains isolated from Iranian and Afghan patients. Chemotherapy, 52: 316-320.

Wanchu, A., Y. Dong, S. Sethi, V.P. Myneedu, A. Nadas, Z. Liu, J. Belisle and S. Laal, 2008. Biomarkers for clinical and incipient tuberculosis: Performance in a TB-endemic country. PLoS ONE, 3: e2071-e2071.

World Health Organization, 1993. Tuberculosis program. Tuberculosis Notification Update: December Geneva, Switzerland: World Health Organization, 1994. Publication WHO/TB/94.175.