Original Paper

First report on the shortest CPB peptide chain in the Leishmania donovani complex and bioinformatical interpretations in relation with this mutation

Maleki Ravasan N (MSc)[1], Hide M (PhD)[2], Javadian E (PhD)[3]
Oshaghi MA (PhD)*[4], Sadraei J (PhD)[5]

[1]MSc, Department of Medical Parasitology and Entomology, College of Medical Sciences, Tarbiat Moddares University, Tehran, Iran. [2]Professor, Department of Parasitology, G'en'etique et Evolution des Maladies Infectieuses, IRD/CNRS (UMR 2724), F-34394, France. [3]Professor, Department of Medical Entomology and Vector Control, School of Public Health and Institute of Health Research, Tehran University of Medical Sciences, Tehran, Iran. [4]Associate Professor, Department of Medical Entomology and Vector Control, School of Public Health and Institute of Health Research, Tehran University of Medical Sciences, Tehran, Iran. [5]Associate Professor, Department of Medical Parasitology and Entomology, College of Medical Sciences, Tarbiat Moddares University, Tehran, Iran.

Abstract

Background and Objective: Visceral Leishmaniasis or Kala-azar is an important infectious disease in northwestern Iran. Members of the *Leishmania donovani* complex, *L. donovani* and *L.infantum*, are the two main parasites causing the disease in the world. In this study immunophenotype characters such as N-glycosylation, and T-cell and B-Cell epitopes of CPB gene was evaluated in the *Leishmania* parasites isolated from sandflies of the region.

Materials and Methods: Partial of the CPB (702-741 bp) of *Leishmania* parasites was amplified and sequenced and used for bioinformatics analysis such as test three dimensional (3D) protein structure, N-glycosylation, and T-cell and B-Cell epitopes.

Results: In 7 out of 3477 sand flies there was a positive PCR test for systeine protease B, gene. Also according to findings of this study, both agents of kala-azar *L. donovani* and *L. infantum* were bing transfered by sand flies of *Phlbtomus perfiliewi transcaucasicus* in North West Iran. DNA analysis of the CPB gene showed a cytosine insertion at 5' end of the proofreading frame of the gene resulted in a stop codon (TGA) seven AA further down and hence translation is halted. This caused a short amino acid chain with only 76 AA much shorter than normal CPB peptide with 234-247 AA. This mutation has not been found in the *L.infantum* strain resulted in a normal CPB peptide. AA analysis showed no N-glycosylation site, T-cell and B-Cell epitopes on the short peptide of the *L. donovani* strain.

Conclusion: This is the shortest CPB peptide chain reported for the *L. donovani* complex in the literature. This short peptide could have an effect on host-parasite and vector-parasite interactions. Since the CPBs genes have important implication on host–parasite and play key roles in infection and expression of the disease, further studies on the *L. donovani* parasite and its diminutive peptide necessitate to improve our understanding about the epidemiology of visceral leishmaniasis in Iran.

Keywords: CPBs, Host–Parasite Interactions, Kala-azar, *Leishmania donovani* complex, Iran

*** Corresponding Author:** ***Oshaghi MA (PhD), E-mail: moshaghi@sina.tums.ac.ir***

Received 27 May 2009 **Accepted** 3 Jan 2010