

## Serum Levels of Interleukin 10 (IL-10) in Patients with Type 2 Diabetes

### Dear Editor,

The frequency of diabetes mellitus is increasing and it is expected that this disorder will affect 300 million people in 2025.<sup>1</sup> It has been suggested that diabetes is an immune dependent disease in which the pattern of cytokine expression is changed.<sup>2</sup> As an example, in type 2 diabetes, the monocytes of peripheral blood produce more inflammatory cytokines than those from normal patients.<sup>2</sup> The association of IL-10 in immunological disorders such as multiple sclerosis,<sup>3,4</sup> nephrotic syndrome<sup>5, 6</sup> and type-1 diabetes<sup>7,8</sup> is well established. The key role of IL-10 is to work as the main inhibitory cytokine against the action of inflammatory cytokines such as IL-12. Based on evidence suggesting that immune responses may be important in inducing type 2 diabetes,<sup>9</sup> this study was designed to evaluate serum levels of IL-10 in type 2 diabetes. Peripheral blood samples were collected from 131 type 2 diabetic patients and 120 healthy controls. The patient and control groups were matched for sex and age. IL-10 serum level was measured using ELISA kit (eBioscience, Spain) in both groups. The differences in variables were analyzed by student t tests. Results of our study showed that the mean IL-10 serum level was  $9.53 \pm 2.27$  and  $16.11 \pm 2.27$  pg/ml in type 2 diabetic patients and control groups, respectively. Statistical analysis showed that the difference was significant ( $p < 0.005$ ). Our

findings indicated a significant difference between IL-10 serum levels in type 2 diabetic patients compared to healthy controls. Other researchers also showed same results such as Eric VE *et al.*, 2002 who indicated that the serum levels of IL-10 decreased in type 2 diabetic patients compared to controls.<sup>10</sup> Based on this fact, it may be concluded that low serum levels of IL-10 can be considered as a risk factor of type 2 diabetes.

**Keywords:** Interleukin 10; Type 2 diabetes

**Conflict of interest:** None declared.

**N Yaghini<sup>1</sup>, M Mahmoodi<sup>1,2\*</sup>, GhR Asadikaram<sup>1</sup>, GhH Hassanshahi<sup>2</sup>, H Khoramdelazad<sup>2</sup>, M Kazemi Arababadi<sup>3,4</sup>**

<sup>1</sup>Department of Biochemistry, <sup>2</sup>Molecular-Medicine Research Center, <sup>3</sup>Department of Microbiology, Hematology and Immunology, <sup>4</sup>Infectious and Tropical Disease Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran

\*Correspondence: Mehdi Mahmoodi, PhD, Department of Biochemistry, Faculty of Medicine, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. Tel: +98-391-5234003-5, +98-913-1914855, Fax: +98-391-5225209, e-mail: [mahmoodies@yahoo.com](mailto:mahmoodies@yahoo.com)  
Received: April 12, 2011 Accepted: July 25, 2011

### References

- 1 Steyn NP, Lambert EV, Tabana H. Nutrition interventions for the prevention of type 2 diabetes. *Proc Nutr Soc* 2008;**10**:1-16.
- 2 Giulietti A, van Etten E, Overbergh L, Stoffels K, Bouillon R, Mathieu C. Monocytes from type 2 diabetic patients have a pro-inflammatory profile. 1,25-Dihydroxyvitamin D(3) works as anti-inflammatory. *Diabetes Res Clin Pract* 2007;**77**:47-57. [17112620] [<http://dx.doi.org/10.1016/j.diabres.2006.10.007>]
- 3 Bartosik-Psujek H, Stelmasiak Z. The interleukin-10 levels as a potential indicator of positive response to interferon beta treatment of multiple sclerosis patients. *Clin Neurol Neurosurg* 2006;**108**:644-7. [16343740] [<http://dx.doi.org/10.1016/j.clineuro.2005.10.011>]
- 4 Jana M, Pahan K. IL-12 p40 homodimer, but not IL-12 p70, induces the expression of IL-16 in microglia and macrophages. *Mol Immunol* 2009;**46**:773-83. [19100623] [<http://dx.doi.org/10.1016/j.molimm.2008.10.033>]
- 5 Araya C, Diaz L, Wasserfall C, Atkinson M, Mu W, Johnson R, Garin E. T regulatory cell function in idiopathic minimal lesion nephrotic syndrome. *Pediatr Nephrol* 2009;**24**:1691-8. [19495805] [<http://dx.doi.org/10.1007/s00467-009-1214-x>]
- 6 Lin CY, Chien JW. Increased interleukin-12 release from peripheral blood mononuclear cells in nephrotic phase of minimal change nephrotic syndrome. *Acta Paediatr Taiwan* 2004;**45**:77-80. [15335115]
- 7 Lee M, Park H, Youn J, Oh ET, Ko K, Kim S, Park Y. Interleukin-10 plasmid construction and delivery for the prevention of type 1 diabetes. *Ann N Y Acad Sci* 2006;**1079**:313-9. [17130572] [<http://dx.doi.org/10.1196/annals.1375.048>]
- 8 Wegner M, Winiarska H, Bobkiewicz-Kozłowska T, Dworacka M. IL-12 serum levels in patients with type 2 diabetes treated with sulphonylureas. *Cytokine* 2008;**42**:312-6. [18397831] [<http://dx.doi.org/10.1016/j.cytok.2008.05.007>]

- 1016/j.cyto.2008.02.014]
- 9 Bagavant H, Fu SM. Pathogenesis of kidney disease in systemic lupus erythematosus. *Curr Opin Rheumatol* 2009;**21**:489-94. [19584729] [<http://dx.doi.org/10.1097/BOR.0b013e32832efff1>]
- 10 van Exel E, Gussekloo J, de Craen AJ, Frölich M, Bootsma-Van Der Wiel A, Westendorp RG; Leiden 85 Plus Study. Low production capacity of interleukin-10 associates with the metabolic syndrome and type 2 diabetes: the Leiden 85-Plus Study. *Diabetes* 2002;**51**:1088-92. [11916930] [<http://dx.doi.org/10.2337/diabetes.51.4.1088>]

Archive of SID