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ANALYSIS OF ROLE OF IL10RA GENE IN GENETIC POLYMORPHISMS IN LEUKEMIA PATIENTS

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Abstract:
The main objective of this study is to find the correlation of genetic polymorphisms in IL10RA *which modify the association of blood transfusion and induce apoptosis of human leukemia. This descriptive study was conducted in Hina Hospital, Lahore during March 2019 to October 2019. There was no violence of rules and regulations of authority. All histologically confirmed cases of leukemia diagnosed from 2015 to 2016 in a hospital. Our results suggested that there is no positive correlation between IL10RA and leukemia disease. Our results suggest that genetic polymorphism in IL10RA gene modifies the association between blood transfusion and risk of leukemia B-cells.*

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INTRODUCTION:

Before 19th century it was thought that all the blood was same and this misunderstanding was lead to the fetal transfusion of blood. Even human blood is not the same. People belong to the different blood groups depending upon the antigens present in the blood. Almost 25 different types of blood groups were present but most common are ABO and Rh systems[1]. Blood transfusion mainly allogeneic blood transfusion can induce immune suppression and has been suggested as a risk factor for leukemia[2].

Molecular genotyping methods were introduced to the transfusion medicine community over a decade ago. Epidemiological studies linking blood transfusion to the risk of leukemia but they provided inconsistent results[3]. B-lymphocytes are characterized by the expression of CD19 surface antigen, which is present on the progenitor cells of bone and persists during all stages of B-cell maturation[4].

T-helper cells play an important role in the regulation of key pathways of immune system. Imbalanced regulation and expression of Th1 and Th2 lymphocyte cytokines have been linked to the development of different blood diseases[5]. Single nucleotide polymorphisms in *TNF* and *IL10*have been reported to be associated with the risk of leukemia[6]. Damaged autologous erythrocytes during blood transfusion has been shown to augment the cytokines TNF-α and IL-10 production of the mononuclear phagocyte system in humans[7].

Aims of the study

The main objective of this study is to find the correlation of genetic polymorphisms in *IL10RA* which modify the association of blood transfusion and induce apoptosis of human leukemia

MATERIAL AND METHODS:

This descriptive study was conducted in Hina Hospital, Lahore during March 2019 to October 2019. Enrollment criteria include the age between 20 to 50 years. Pathology slides from all patients were obtained from the original pathology departments and reviewed by two independent pathologists.

A genotyping experiment is an end point experiment which is used to determine the genotype of samples in Shoukat Khanum Laboratory center. In this experiment we can easily differentiate between two alleles of SNP. First of all I was collected the sample for this experiment with the help of medical staff of hospital. The concordance rate of all the samples was also measured. The specific type of fluorescent dye was used for PCR. Taq Man® genotype plate was used for the best results. For genotype analysis forward and reverse primers were used.

Statistical analysis

Unconditional logistic regression was used to find out the odds ratios (ORs) and 95% confidence intervals for relations between blood transfusion, and risk of leukemia. All *P* values presented in the results are two-sided, and all analyses were performed by using SAS software (version 9.2).

RESULTS:

The association between blood transfusion and leukemia B-cells are clearly presented in the table 01 and 02. Table 01 represents the primer sequence of genes and table 02 shows the Associations between *IL10RA* Polymorphisms, Blood Transfusion, and risk of leukemia.

Table 01: Primer Sequences for PCR

Gene	Forward Primer	Reverse Primer	Ref
Abcg5	5'-TTGCGATACACAGCGATGCT-3'	5-TGACTGCCTCTACCTTCTTGTTGT–3'	(Song, et al., 2010)
Abcg8	5'-CCGTCGTCAGATTTCCAATGA-3'	5'-GGCTTCCGACCCATGAATG-3'	-do-
Ldlr	5'-GCTCCATAGGCTATCTGCTCTTCA-3'	5'-CTGCGGTCCAGGGTCATC-3'	-do-
CYP7A1	5'-CCATGATGCAAAACCTCCAAT-3'	5'-ACCCAGACAGCGCTCTTTGA-3'	-do-
MIR33a (Probe sequence)		5′- GUGCAUUGUAGUUGCAUUG-3′	(Li, et al., 2013)

Table 02: Associations between *IL10RA* Polymorphisms, Blood Transfusion, and risk of leukemia

	Overall						**B-cell lymphoma**			
	Blood transfusion						**Blood transfusion**			
	No			**Yes**			**No**		**Yes**	
SNPs	**Control**	**Case**	**OR**	**Control**	**Case**	**OR**	**Cases**	**OR**	**Cases**	**OR**
IL10RA										
GG	121	103	1.0	33	47	1.9	76	1.0	33	1.0
AG/AA	376	251	1.0	86	42	0.6	206	1.0	35	1.0
P-interaction	**0.003**						**0.001**			

We also collected the patient's history and compared this data to those patients who have not the history of blood transfusion. The patients who have the history of blood transfusion are suffering from high risk of leukemia if they carried IL10RA GG genotype. And this risk is minimized when they contain IL10RA AG/AA genotype.

DISCUSSION:

This is the first comprehensive analysis of relation of blood transfusion and risk of leukemia in humans. There is a significant difference were observed in for *IL10RA* and *TNF* for leukemia and the high production of white blood cells. No interactions were observed for blood transfusion and the high production of white blood cells. For the clarification of this statement higher studies will required for further clarification[8].

The IL-10RA receptor chains have an extracellular domain consisting of 200 amino acids, a transmembrane helix consisting of 20 amino acids, and an intracellular domain consisting of 322 amino acids for IL-10RA[9]. IL10 and TNF were considered to be the key genes for lymphomagenesis. Both the genes code the immunoregulatory cytokines that are considered to be critical mediators of inflammation and apoptosis and also for lymphoid tumors[10]. Different studies related to TNF and IL10 shows that each cell effects on B-cell lymphomagenesis by direct or indirect way[11].

CONCLUSION:

Our results suggest that genetic polymorphism in IL10RA gene modifies the association between blood transfusion and risk of leukemia B-cells.

REFERENCES:

1. Nadler LM, Anderson KC, Marti G, et al. B4, a human B lymphocyte-associated antigen expressed on normal, mitogen-activated, and malignant B lymphocytes. Immunol 1983; 131: 244-50.
2. Reid ME. Applications of DNA-based assays in blood group antigen andantibody identification. Transfusion 2003; 43:1748–1757.
3. Brunson ME, Alexander JW. Mechanisms of transfusion-induced immunosuppression. Transfusion 1990; 30: 651–658.
4. Blumberg N, Heal JM. Effects of transfusion on immune function. Cancer recurrence and infection. Arch Pathol Lab Med 1994; 118: 371–379.
5. Triulzi DJ, Heal JM, Blumberg N. Transfusion-induced immunomodulation and its clinical consequences. In: Nance SJ, editor. Transfusion Medicine in the 1990′s. Arlington, VA: American Association of Blood Banks; 1990. pp 1–33.
6. Klein HG. Immunomodulatory aspects of transfusion: A once and future risk? Anesthesiology 1999; 91: 861–865.
7. Castillo JJ, Dalia S, Pascual SK. Association between red blood cell transfusions and development of non-Hodgkin lymphoma: A meta-analysis of observational studies. Blood 2010; 116: 2897–2907.
8. Lan Q, Zheng T, Rothman N, et al. Cytokine polymorphisms in the Th1/Th2 pathway and susceptibility to non-Hodgkin lymphoma.Blood 2006; 107: 4101–4108.
9. Rothman N, Skibola CF, Wang SS, et al. Genetic variation in TNF and IL10 and risk of non-Hodgkin lymphoma: A report from the InterLymph Consortium. Lancet Oncol 2006; 7: 27–38.
10. Liese AM, Siddiqi MQ, Siegel JH, et al. Augmented TNF-alpha and IL-10 production by primed human monocytes following interaction with oxidatively modified autologous erythrocytes. J Leukoc Biol 2001; 70: 289–296.
11. Li, T., Francl, J. M., Boehme, S., & Chiang, J. Y. Regulation of cholesterol and bile acid

homeostasis by the cholesterol 7alpha-hydroxylase/steroid response element-binding protein 2/microRNA-33a axis in mice. Hepatology,2013; 58(3), 1111-1121.