

Original Research

Estimation of hematological parameters in oral lichen planus patients and its correlation with age and gender

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ABSTRACT:

Introduction: Lichen planus (LP) is a T-cell mediated autoimmune disease of the skin and mucous membranes. Although the exact pathogenesis of the disease remains unclear, it is believed that LP represents an inflammatory disorder. **Aims & objective:** To evaluate and compare the variation in the hematological parameters in patients with oral lichen planus than those of healthy individuals with respect to age and gender. **Materials and method:** A case-control study was carried out in the Department of Oral Pathology, Govt. Dental College and Hospital, Srinagar and the study group comprised of 15 cases of oral lichen planus as well as 15 cases of healthy individuals. Blood samples were collected from the patients with oral lichen planus and healthy individuals to determine the variation in the hematological parameters. **Result:** There was statistically significant difference between LP patients and healthy controls in terms of leucocyte count, neutrophil count, platelet count, lymphocyte count, NLR and PLR values. **Conclusion:** NLR and PLR are considered as an inflammatory parameters providing valuable information in the diagnosis of various diseases and in determining its prognosis.

Keywords: Inflammation, Neutrophil-To-Lymphocyte Ratio; Platelet-To-Lymphocyte Ratio, Leucocyte count

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INTRODUCTION

Oral lichen planus (OLP) is a chronic inflammatory disease that affects the mucous membrane of the oral cavity. It is a T-cell mediated autoimmune disease in which the cytotoxic CD8+ T cells trigger apoptosis of the basal cells of the oral epithelium. Several antigen-specific and nonspecific inflammatory mechanisms have been put forward to explain the accumulation and homing of CD8+ T cells subepithelially and the subsequent keratinocyte apoptosis.¹⁻⁴ In LP, levels of cytokines such as TNF alpha and IL-10 are increased in cutaneous lesions and serum. These cytokines, which play a role in LP pathogenesis, are thought to be associated with chronic inflammation.⁴⁻⁶ The prevalence of OLP in the normal adult population is 0.49–1.43%.⁷ It is clinically characterized with violet-coloured, flat, polygonal papules or plaques on the ankles, thighs, abdomen and extremities.⁸ OLP shows predominance among females and mainly affects adult patients between their fifth and sixth decades of life. The most frequently involved oral sites are mucosa of the cheek, tongue and gingiva. The mucosa

of the palate and floor of the mouth is rarely affected.^{9,10} The clinical features of OLP are generally polymorphic and usually consist of bilateral and/or multiple symmetric lesions, with manifestation of associated clinical patterns. Clinically, OLP is classified into six forms i.e. reticular, plaque-like, papular, atrophic, erosive and bullous. The reticular form is the most common followed by the erosive and atrophic form. Erosive and atrophic forms of OLP manifest painful symptoms and have been associated with possible malignant transformation of oral lichen planus.¹¹ The aim of the present study was to evaluate and compare the variation in the hematological parameters in patients with oral lichen planus than those of healthy individuals with respect to age and gender.

MATERIALS AND METHOD

A case-control study was carried out in the Department of Oral Pathology, Govt. Dental College and Hospital, Srinagar and the study group comprised of 15 cases of oral lichen planus as well as 15 cases of

healthy individuals. Patients with other inflammatory skin diseases, cardiovascular disease, gastrointestinal disease, renal disease, malignancy, pregnancy, diabetes mellitus (DM), autoimmune, infectious and inflammatory diseases and treated cases of oral lichen planus were excluded from the study. The tourniquet was released after collection of 4 millimeters of blood from the patients with oral lichen planus as well as healthy individuals and the patient was asked to open his or her fist. The needle was removed and the punctured site was immediately covered with a piece of dry cotton wool. The needle was removed from the syringe and the blood was delivered into a commercially prepared concentration of Ethylene diamine tetra acetic acid (EDTA) tube to determine the variation in the hematological parameters in relation to age and gender. Complete blood counts were calculated by ABX Micros ES 60 Hematology analyzer. NLR (Neutrophil to lymphocyte ratio) value is calculated by dividing the neutrophil count by the lymphocyte count, while PLR (Platelet to lymphocyte ratio) value is calculated by dividing the platelet count by the lymphocyte count. The data was analysed by using statistical software (SPSS version 19.0). Mean and standard deviation were calculated for each individual group. A probability value (p) of ≤ 0.05 was considered to be statistically significance.

RESULTS

In the present study, majority of patients were females and the age of the subjects in this study were 30-55 years. In this study, there was no statistically significant difference between patients with LP and healthy individuals in terms of gender and age. The mean leucocyte count in oral lichen planus patients and healthy controls were 9.2 ± 1.08 and 8.4 ± 1.25 respectively with a statistically significant p-value. The mean neutrophil count in oral lichen planus patients and healthy controls were 5.89 ± 1.48 and 4.8 ± 1.45 respectively with a statistically significant p-value. The mean lymphocyte count in oral lichen planus patients and healthy controls were 2.98 ± 6.32 and 2.24 ± 7.48 respectively with a statistically significant p-value. The mean platelet count in oral lichen planus patients and healthy controls were 295 ± 52 and 282 ± 72 respectively with a statistically significant p-value. The NLR in oral lichen planus patients and healthy controls were 1.58 ± 0.69 and 1.75 ± 0.72 . The p-value was found to be statistically significant. The PLR in oral lichen planus patients and healthy controls were 112.22 ± 41.08 and 123 ± 53.4 . The p-value was found to be statistically significant (Table 1).

Table 1: Hematological parameters in oral lichen planus and healthy controls

Parameters	Oral lichen planus	Healthy controls	P-value
Leucocyte count (mean \pm SD) $\times 10^3$	9.2 ± 1.08	8.4 ± 1.25	0.001
Neutrophil count (mean \pm SD) $\times 10^3$	5.89 ± 1.48	4.8 ± 1.45	0.001
Lymphocyte count (mean \pm SD) $\times 10^3$	2.98 ± 6.32	2.24 ± 7.48	0.001
Platelet count (mean \pm SD) $\times 10^3$	295 ± 52	282 ± 72	0.001
NLR	1.58 ± 0.69	1.75 ± 0.72	0.001
PLR	112.22 ± 41.08	123 ± 53.4	0.001

SD- Standard deviation, NLR- Neutrophil to lymphocyte ratio, PLR- Platelet to lymphocyte ratio

DISCUSSION

LP is chronic inflammatory disease that affects the skin, genitalia, mucous membranes and appendages, although the etiology and pathogenesis are not yet fully understood. LP is thought to be a T-cell mediated inflammatory tissue reaction leading to a cytotoxic reaction to epithelial basal cells.¹²⁻¹⁴

Neutrophils and lymphocytes are important blood cells involved in the inflammation process. Neutrophils initiate the first line of defense in systemic inflammation. Lymphocytes constitute the regulatory and protective component of inflammation. LP patients have intense lymphocytic inflammation in the skin, so it has been reported that lymphocyte clustering from the blood system may lead to lymphocyte reduction in patients with LP. Yamamoto et al have shown that both lymphocyte and neutrophil functions are impaired in oral LP.¹⁵⁻¹⁷

In the present study, the leukocyte count, neutrophil count, lymphocyte count and platelet count are more than that of the normal subjects with statistically

significant p-value. These results were not in accordance with the study done by An I et al.¹⁸

NLR is an easy to calculate and highly cost-effective inflammatory parameter. NLR has become an easy and practical method of providing valuable information in the diagnosis of various diseases and in determining its prognosis. NLR has been shown to be increased in many diseases lead to inflammation such as metabolic syndrome, hypercholesterolemia, diabetes mellitus, hepatic cirrhosis, psoriasis vulgaris, psoriatic arthritis, cardiovascular diseases and malignancies which are common in the community.¹⁹⁻²²

NLR values were found to be significantly higher in patients with LP as compared to the control group and these findings were in contrast with the study done by An I et al.¹⁸ However, these results were similar with the study carried out by Ozlu et al.²³

Platelets are discoidal cells with an average length of 1-2 μ m and an average life span of 8-10 days. Apart from hemostasis, platelets also play an important role in angiogenesis, inflammation, allergic reactions, repair and regeneration of tissues and release

chemokine and cytokines that produce a strong inflammatory response. PLR value can be used as an indicator of inflammation.²⁴⁻²⁵ In the present study, there was statistically significant difference between LP patients and healthy controls in terms of PLR values. These results were in contrast with the study done by An I et al.¹⁸ However, in the study carried out by Ertem et al, PLR values were significantly higher in patients with LP compared to the control group.⁵

CONCLUSION

There was statistically significant difference between LP patients and healthy controls in terms of leucocyte count, neutrophil count, platelet count, lymphocyte count, NLR and PLR values. NLR and PLR are considered as an inflammatory parameters providing valuable information in the diagnosis of various diseases and in determining its prognosis. Future studies should be performed in a large series of patients with LP and also before and after treatment.

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