



Neutrophil Lymphocyte Ratio in Patients Receiving Isotretinoin for Acne Vulgaris

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Abstract

The aim of this study is to assess the neutrophil, lymphocyte and neutrophil lymphocyte ratio in patients receiving isotretinoin for acne treatment. 110 (64 women, 46 men) patients with acne vulgaris were included in this study. Patients were treated with 0.5-1 mg/kg/day isotretinoin. The laboratory results were collected retrospectively from the patients' records. Neutrophils, lymphocytes, and neutrophils lymphocytes ratio before treatment and at the third months after the treatment were collected retrospectively. Statistical analysis was performed using PASW Statistics 18. Paired sample T-test was used to compare pre-and post treatment parameters. The mean number of neutrophils in patients with pre-treatment and post-treatment were; 4354 ± 1623 and 4147 ± 1659 , the mean lymphocyte counts were 2410 ± 716 and 2384 ± 681 and NLO values before and after treatment were 2.06 ± 1.42 and 2.00 ± 1.99 , respectively. There is no statistically significant difference for the three values ($p > 0.05$). The effect of isotretinoin therapy in patients with acne vulgaris is not determined on neutrophil and lymphocyte counts and neutrophil lymphocyte ratio.

Key Words: Acne, neutrophil, lymphocyte, neutrophil lymphocyte ratio

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Introduction

Acne vulgaris is a self-limited, chronic inflammatory disease, which usually affects the pilosebaceous unit in adolescents [1]. It is seen nearly in 80% of the adolescents and the young adults between the ages of 11-30 [2]. Isotretinoin is an active retinoic acid derivative used in medium and severe form of acne vulgaris. Isotretinoin indirectly generates anti-inflammatory effect by decreasing the population of *Propionibacterium acnes* [3]. Isotretinoin might demonstrate antiinflammatory effect both treating acne vulgaris and changing the inflammatory process by its anti inflammatory properties. Lymphocyte and neutrophil counts vary in a range of inflammatory diseases. NLR, obtained by dividing neutrophil count to the lymphocyte count, is studied in numerous inflammatory, cardiovascular diseases and malignancy [4,5]. Park JJ et al. demonstrated the importance of NLR in atherosclerosis, which is an inflammatory process⁶. The higher NLR is thought to be associated with bad prognosis. However, different basal “cut-off” NLR was used in various studies. Even though NLR was previously investigated in numerous diseases, no study was demonstrated the role of NLR following the anti inflammatory isotretinoin treatment in acne vulgaris. In this study, the changes in the parameters such as neutrophil and lymphocyte count and NLR were retrospectively investigated in acne vulgaris patients who received isotretinoin treatment.

Materials and methods

A total of 110 patients who were clinically diagnosed with acne vulgaris and received isotretinoin treatment in the dermatology clinic of Konya Research and Training Hospital, were included in the study. The patients receiving at least three months of isotretinoin treatment at the dose of 0.5-1mg/kg daily were studied. Lymphocyte, neutrophil counts and NLR were recorded prior to and three months following the treatment. The patients with a history of immunosuppressive medication, systemic diseases (diabetes mellitus, hepatitis, chronic heart and renal diseases and malignancy) and under the age of 16 were excluded from the study. Local ethical committee approval was obtained. Parameters were analyzed using laser flow cytometry method with Sysmex XT-2000i. Statistical analysis was made using PASW Statistics 18. Data were expressed as medians (minimum-maximum). Parameters prior to and following the treatment were compared using Wilcoxon test. Student T test was applied in comparison of the parameters between the genders. A p value less than 0.05 was considered as statistically significant.

Results

A total of 110 patients, 64 females (58.2%) and 46 males (41.8%) were included in the study. The mean age was 20.73 ± 5.6 years (the range was 16-39). Median neutrophil count was 4130/UL (minimum: 1740-maximum: 9050) prior to the treatment, was 3970/UL (minimum: 1840-maximum: 10300) following the treatment; median lymphocyte count was 2345/UL (minimum: 260-maximum: 4100) prior to the treatment, was 2370/UL (minimum: 170-maximum: 4150) following the treatment; median NLO was 1.68 (minimum: 0.61-maximum: 8.85) prior to the treatment and was 1.55 (minimum: 0.71-maximum: 20.53) following the treatment. No statistically significant difference was noted for these three parameters ($p=0.137$, $p=0.505$, $p=0.445$ respectively) (Figure1). Biochemical test results were shown in Table 1.

Neutrophil count was 4164 ± 1462 /UL; lymphocyte count was 2306 ± 735 /UL and NLR was 2.16 ± 1.64 prior to the treatment in females. These parameters were as follows in males prior to the treatment: Neutrophil: 4607 ± 1854 /UL, lymphocyte: 2556 ± 666 /UL, NLR: 1.93 ± 1.31 . There were no significant differences between the genders based on these parameters prior to the treatment ($p=0.172$, $p=0.075$, $p=0.425$ respectively).

Following the treatment, neutrophil count was 4162 ± 1632 /UL, lymphocyte count was 2423 ± 643 /UL and NLR was 2.04 ± 2.52 in females. On the other hand, these parameters were found as following: neutrophil count: 4111 ± 1727 /UL, lymphocyte count: 2362 ± 714 /UL and NLR: 1.90 ± 0.90 in males after the treatment. No statistically significant difference was found between the genders based on the neutrophil, lymphocyte count and NLR ($p=0.914$; $p=0.507$; $p=0.826$ respectively).

Table 1: The mean neutrophil, leukocyte counts and NLR prior to and three months following the isotretinoin treatment in the patients with acne vulgaris.

	Pretreatment	Posttreatment
Neutrophil	4354±1623	4147±1659
Lymphocyte	2410±716	2384±681
NLR	2.06±1.42	2.00±1.99

The values were demonstrated as medians (minimum-maximum).

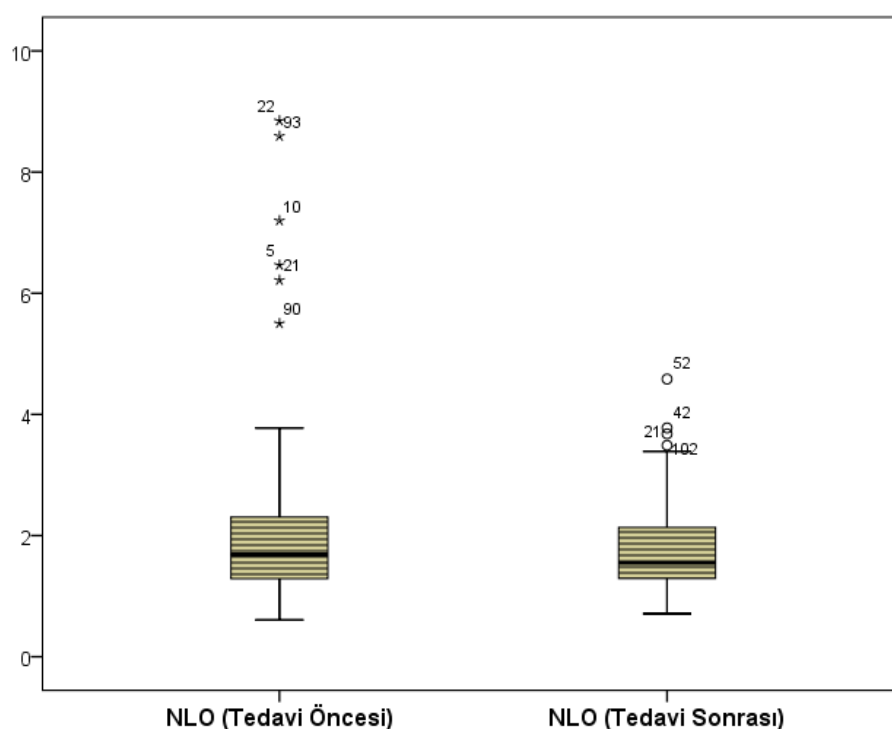


Figure 1. The comparison of NLR (Neutrophil/Lymphocyte Ratio) prior to and three months following the treatment in the patients with acne vulgaris.

Discussion

No changes in neutrophil, lymphocyte counts and NLR were demonstrated following the treatment compared to the values prior to the treatment in the present study. The possible explanation for this finding might be the fact that acne vulgaris is a local inflammatory disease and/or the addition of unknown processes in the anti inflammatory activity of isotretinoin might have also played a role. Systemic inflammation can measured by NLR has significant association with prevalent chronic conditions. Future research needs to investigate the relationship with longitudinal data to establish the temporal relationship between these. Since there is no adequate number of studies published, further investigations with larger sample size are needed to explain the antiinflammatory effect of isotretinoin on the leukocyte and neutrophil counts and NLR.

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