ÖZGÜN ARAŞTIRMA ORIGINAL RESEARCH

Med J SDU / SDÜ Tıp Fak Derg ▶ 2020:27(2):210-213 doi: 10.17343/sdutfd.542144

PLATELET-TO-LYMPHOCYTE (PLR) RATIOS IN ADENOIDECTOMY PATIENTS

ADENOİDEKTOMİ YAPILAN HASTALARDA PLATELET-LENFOSİT ORANI

Mehmet Emre SİVRİCE[1], Hasan YASAN[1], Mustafa TÜZ[1], Erdoğan OKUR[1], Deniz DİLEK[1], Vural AKIN[1]

[1] Department of Oto-Rhino-Laryngology and Head&Neck Surgery, Faculty of Medicine, S.Demirel University, Isparta, Turkey

Cite this article as: Sivrice ME, Yasan H, Tüz M, Okur E, Dilek D, Akın V. Platelet-To-Lymphocyte (Plr) Ratios İn Adenoidectomy Patients. Med J SDU 2020; 27(2): 210-213.

Öz

Amaç
Bu çalışmada adenoidektomi hastalarında platelet-lenfosit oranının (PLO) prediktif bir faktör olup olmadığının ve adenoid hipertrofisi olan hastalarda platelet-lenfosit oranının sistemik inflamasyonu gösterip göstermediğinin ortaya konulması amaçlandı.

Gereç ve Yöntem
Çalışma grubuna Süleyman Demirel Üniversitesi Kulak Burun Boğaz Anabilim Dalı'nda (KBB) 2017-2018 yılları arasında adenoid hipertrofisi tanısı alan 3-11 yaşları arasında toplam 100 erkek hasta dahil edilmiştir. Kontrol grubu, Üroloji ve Çocuk Cerrahisi kliniklerinde sünnet edilen 100 sağlıklı erkekten oluşmaktaydı. Hastaların tıbbi kayıtları retrospektif olarak incelendi. Preoperatif laboratuvar parametreleri hasta dosyaları gözden geçirilerek değerlendirildi. Platelet-lenfosit oranı mutlak platelet sayısının mutlak lenfosit sayısına bölünmesi ile elde edildi.

Bulgular
Platelet-lenfosit oranı kontrol ve çalışma grupları için sırasıyla 91,68 ve 84,15 idi ve aradaki fark istatistiksel olarak anlamlı değildi (Mann-Whitney U testi, p=0,062). Mann-Whitney U testi ile WBC, platelet ve lenfosit sayıları değerlendirildiğinde çalışma ve kontrol grupları arasında anlamlı bir fark izlenmedi. (p>0,05). Kontrol grubunda platelet-lenfosit oranı, çalışma grubuna göre daha yüksekti.

Sonuç
Platelet ve lenfosit standart sapmalarının çok yüksek olduğunu gözlemledik, bu nedenle adenoidektomide platelet-lenfosit oranının güvenilir bir değer olmadığı kanaatine varıldı.

Anahtar Kelimeler: Adenoid hipertrofisi, Platelet-Lenfosit Oranı (PLO), Sistemik İnflamasyon

Abstract

Objective
The aim of this study is to investigate Platelet-to-lymphocyte (PLR) ratios in children operated for adenoid hypertrophyto determine whether this ratio can be a possible predictive factor in adenoidectomy. We also aimed to investigate whether PLR can help indicate ongoing systemic inflammation on patients with adenoid hypertrophy.

Materials and Methods
One hundred boys aged 3-11 years, who had undergone adenoidectomy for adenoid hypertrophy between 2017 and 2018 at Suleyman Demirel University, Department of Ear Nose and Throat (ENT), were assigned to the study group. The control is 100 healthy boys who had been circumcised in the Urology or Pediatric Surgery Departments. Patients medical records were retrospectively reviewed. The results

İletişim kurulacak yazar/Corresponding author: vuralakin92@gmail.com
Müracaat tarihi/Application Date: 20.03.2019 • Kabul tarihi/Accepted Date: 17.04.2019
Available online at http://dergipark.gov.tr/sdutfd
Makaleye http://dergipark.gov.tr/sdutfd web sayfasından ulaşılabilir.

of preoperative complete blood counts were evaluated by reviewing the patient files. We calculated the PLR value by dividing platelet count with lymphocyte count.

Results
PLR were 91,68 and 84,15 for control and study groups respectively and the difference was not statistically significant (Mann-Whitney U test, p = 0.062). The Mann-Whitney U test showed no significant difference between study and control groups among WBC, platelet and lymphocyte counts (p >0.05). PLR of the control group was greater than the study group.

Conclusion
We observed platelet and lymphocyte standard deviations are too high, therefore we beleive that PLR is not a reliable value in adenoidectomy

Keywords: Adenoidectomy, Adenoid Hypertrophy, Platelet-to-Lymphocyte Ratio (PLR), Systemic Inflammation

Introduction

Adenoid Hypertrophy (AH) is a common reason of upper airway obstruction in children. This chronic obstruction may result in chronic hypoxia, hypercarbia and finally Obstructive Sleep Apnea Syndrome (OSA). Low-level systemic inflammation and oxidative stress are related to OSA (1). Systemic inflammatory changes that are related with sleep disorders can be illustrated by assessing the levels of inflammatory markers in the peripheral blood.

The neutrophil-to-lymphocyte ratio (NLR) and platelet-to-lymphocyte ratio (PLR) parameters are useful for a very long time in medicine, particularly in the detection of infections and inflammations. Measuring PLR and NLR are cheap and easy testing methods. This ratios have recently come into focus as possible predictive or prognostic factors in some infections and malignancies. The studies on NLR and PLR has been increasing in recent years. NLR and PLR have been designated as inflammatory markers which can easily studied in the routine blood samples. NLR and PLR are predictors of inflammation and the various fields in which they can be used are being highlighted in a number of new studies. For example, studies have been con-ducted not only on infections and cancers, but also peripheral facial paralysis, familial mediterranean fever, cardiac disease (acute coronary syndromes, heart failure and coronary revascularization procedures) vertigo, cholesteatoma (2-9). Even so, in the literature there isn't any study about PLR performed with patients who underwent adenoidectomy. Our aim in this study is investigating whether PLR can help indicate ongoing systemic inflammation on patients with adenoid hypertrophy.

Materials and Methods

One hundred boys aged 3-11 years, who had undergone adenoidectomy for adenoid hypertrophy between 2017 and 2018 at Suleyman Demirel University, Department of Ear Nose and Throat (ENT), were assigned to the study group.

Routine ear, nose, and throat (ENT) physical examination, transnasal nasopharyngeal endoscopy was performed for all patients to measure the size of the adenoids. Patients who could not tolerate the transnasal nasopharyngeal endoscopy evaluated with the lateral nasopharyngography. Patients who met the following criteria were included:

1. Children without chronic diseases such as diabetes mellitus, hepatic or renal disease, chronic heart disease, haematological disease, thrombocytopenia, hypothyroidism or hyperthyroidism, bronchial asthma, patients who had been receiving steroid therapy for any reason, who had been using drugs likely to increase serum neutrophil and leukocyte count, and those with malignant disease or immunodeficiency disease, obesity (body mass index greater than the 95th percentile).

2. Children with snoring, open-mouth breathing, sleep apnea, difficulty swallowing, and loss of appetite.

3. Children with adenoid hypertrophy greater than 50% nasopharyngeal obstruction without other reasons of nasal blockage like septal deviation, turbinate hypertrophy, allergic rhinitis or anatomic deformities.

A total of 100 boys aged 2-12 years (mean age 7,38), who had undergone circumcisions in the same period in the Urology or Pediatric Surgery clinics, were recruited to the control group. Medical records of the patients were retrospectively evaluated. The results of preoperative complete blood counts were evaluated by reviewing the patient files. Complete blood count was obtained by analyzing the blood samples from the patients and the controls and placed into tubes containing calcium EDTA (Ethylenediaminetetraaceticacid) for use in an automated blood counter device

(Beckman Coulter LH 780 Hematology Analyzer, USA). The blood count indicates absolute cell counts such as white blood cell count, leukocyte count, percentage distribution of white blood cells, neutrophil count, lymphocyte count, platelet count, eosinophil count, monocyte count and basophil count. The PLR is calculated by dividing platelet count with lymphocyte count. The values were compared between the study group and the control group.

Statistics

Statistical analysis of data was done using the SPSS 20.0 for Windows program. Statistical distribution was analyzed by two-sample Kolmogorov-Smirnov test. Student t-test was used for the variables with statistically good distribution, whereas nonparametric Mann-Whitney U test was used for the variables with statistically poor distribution. The study group and the control group were compared in terms of age, WBC, lymphocyte count, thrombocyte, and TLO. The p-value < 0.05 was considered statistically significant.

Results

Comparison for the control group with the study group in terms of complete blood count is summarized in Table 1. The Kolmogorov-Smirnov test revealed that distribution of PLR was not similar in the groups ($p<0.05$ PLR were 91,68 and 84,15 for control and study groups respectively and the difference was not statistically significant (Mann-Whitney U test, $p = 0.062$). The Mann-Whitney U test showed no significant difference between study and control groups among WBC, platelet and lymphocyte counts ($p >0.05$). PLR was higher in the control group as compared to the study group unexpectedly.

Discussion

Platelets are the smallest cells of the peripheral blood. Their primary role is forming a plug in bleeding regions. In peripheral blood 1 mm^3 contains 150,000-400,000 platelets. PLR has been studied in many studies and similar results like NLR were observed. Acharya et al. demonstrated that PLR is superior to NLR in indicating lymph node metastasis in oral cavity cancer (10). Öztürk et al. used PLR in predicting local recurrence in the period of disease-free survival in early-stage tongue cancer (11). Some studies showed that PLR can be used as a prognostic biomarker in chronic obstructive pulmonary disease (12), pulmonary embolus (13), diabetic ketoacidosis (14), and colorectal cancer (15). In our study, we determined no significant difference between the groups in PLR, WBC, platelet and lymphocyte counts. We also observed platelet and lymphocyte standard deviations are too high. This supports that PLR elevation is not a possible predictive factor in adenoidectomy and it can't indicate preoperative ongoing systemic inflammatory status. The main limitation of our study is we don't have the study groups post operative values. Postoperative groups PLR values should also studied to understand if PLR elevation can be a predictive or prognostic factor. The other limitation we can't perform polysomnografy on study group so we don't know the patients OSAS levels. Higher OSAS levels could be related with severity of systemic inflammation and oxidative stress.

Conclusion

In conclusion, we observed platelet and lymphocyte standard deviations are too high, therefore we observed that PLR is not a reliable value in adenoidectomy.

Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

Table 1 Calculated parameters of control and study groups

	Control	Study	p
Age	7.38 ± 1.96	7.67 ± 2.19	0.165
WBC	8.32 ± 2.14	8.54 ± 2.32	0.632
Platelets	328.20 ± 96.20	313.14± 84.4	0.347
Lymphocytes	3.88 ± 1.43	4.14±1.52	0.203
PLR	91,68± 31,57	84,15 ± 31.96	0.062

References

1. Korkmaz M, Korkmaz H, Küçüker F, Ayyıldız SN, Çankaya S. Evaluation of the Association of Sleep Apnea-Related Systemic Inflammation with CRP, ESR, and Neutrophil-to-Lymphocyte Ratio. Medical Science Monitor. 2015;21:477-481.
2. Kiliçkaya M, Tuz M, Yariktaş M, Yasan H, Aynalı G, Bagci Ö. The Importance of the Neutrophil-Lymphocyte Ratio in Patients with Idiopathic Peripheral Facial Palsy. International Journal of Otolaryngology. 2015;2015:1-4.
3. Atan D, Ozcan KM, Koseoglu S, Ikinciogullari A, Cetin MA, Ensari S, et al. New predictive parameters of nasal polyposis: neutrophil to lymphocyte ratio and platelet to lymphocyte ratio. The Turkish Journal of Ear Nose and Throat. 2015;25(2):97-101.
4. Kilickaya MM, Aynali G, Tuz M, Bagci O. Is There A Systemıc Inflammatory Effect of Cholesteatoma?. International Archives of Otorhinolaryngology. 2016;21(01):42-45.
5. Şentürk M, Azgın İ, Övet G, Alataş N, Ağırgöl B, Yılmaz E. The role of the mean platelet volume and neutrophil-to-lymphocyte ratio in peritonsillar abscesses. Brazilian Journal of Otorhinolaryngology. 2016;82(6):662-667.
6. Ulu S, Ulu M, Bucak A, Ahsen A, Yucedag F, Aycicek A. Neutrophil-to-Lymphocyte Ratio as a New, Quick, and Reliable Indicator for Predicting Diagnosis and Prognosis of Idiopathic Sudden Sensorineural Hearing Loss. Otology & Neurotology. 2013;34(8):1400-1404.
7. Derin S, Erdogan S, Sahan M, Topal H, Sozen H. Neutrophil–Lymphocyte Ratio in Patients with Adenoidectomy. Journal of Clinical and Diagnostic Research. 2016;10(3):3-5
8. Tamhane U, Aneja S, Montgomery D, Rogers E, Eagle K, Gurm H. Association Between Admission Neutrophil to Lymphocyte Ratio and Outcomes in Patients With Acute Coronary Syndrome. The American Journal of Cardiology. 2008;102(6):653-657.
9. Núñez J, Núñez E, Bodí V, Sanchis J, Miñana G, Mainar L et al. Usefulness of the Neutrophil to Lymphocyte Ratio in Predicting Long-Term Mortality in ST Segment Elevation Myocardial Infarction. The American Journal of Cardiology. 2008;101(6):747-752.
10. Acharya S, Rai P, Hallikeri K, Anehosur V, Kale J. Preoperative platelet lymphocyte ratio is superior to neutrophil lymphocyte ratio to be used as predictive marker for lymph node metastasis in oral squamous cell carcinoma. Journal of Investigative and Clinical Dentistry. 2016;8(3):e12219.
11. Ozturk K, Akyildiz N, Uslu M, Gode S, Uluoz U. The effect of preoperative neutrophil, platelet and lymphocyte counts on local recurrence and survival in early-stage tongue cancer. European Archives of Oto-Rhino-Laryngology. 2016;273(12):4425-4429.
12. Karadeniz G, Aktoğu S, Erer O, Kır S, Doruk S, Demir M et al. Predictive value of platelet-to-lymphocyte ratio in exacerbation of chronic obstructive pulmonary disease. Biomarkers in Medicine. 2016;10(7):701-710.
13. Karatas MB, Ipek G, Onuk T, Gungor B, Durmus G, Canga Y, et al. Assessment of Prognostic Value of Neutrophil to Lymphocyte Ratio and Platelet to Lymphocyte Ratio in Patients with Pulmonary Embolism. Acta Cardiologica Sinica. 2016;32(3):313-20.
14. Liu W, Lin S, Wang L, Fang C, Lin Y, Braddock M et al. Platelet-to- Lymphocyte Ratio: A Novel Prognostic Factor for Prediction of 90-day Outcomes in Critically Ill Patients With Diabetic Ketoacidosis. Medicine. 2016;95(4):1-7.
15. You J, Zhu G, Xie L, Liu W, Shi L, Wang O et al. Preoperative platelet to lymphocyte ratio is a valuable prognostic biomarker in patients with colorectal cancer. Oncotarget. 2016;7(18):1-12.