

Original Research Article

Evaluation of peripheral blood cell levels in nasal polyposis, antrochoanal polyp and inverted papilloma patients

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Received: 15 May 2021

Accepted: 05 July 2021

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ABSTRACT

Background: Nasal polyps, antrochoanal polyps and Inverted papilloma are nasal masses. The aim of this study the levels and rates of peripheral blood cells are examined in patients with nasal polyps, antrochoanal polyps, and inverted papilloma, and it is investigated whether peripheral blood elements can be used as a marker in the differential diagnosis of these three pathologies

Methods: The files of 70 patients were retrospectively analyzed between January 2015 and December 2018. Patient were divided into three groups as inverted papilloma, nasal polyposis and antrochoanal polyp. Neutrophil, lymphocyte, eosinophil, monocyte and platelet counts, NLR, ELO, MLO, BLO and TLO values of each of these three groups were compared statistically separately.

Results: A total of 70 patients, including 24 nasal polyps, 26 antrochoanal polyps, and 20 inverted papillomas, were included in the study. There was no statistical difference between the groups in terms of NLR, BLO, MLO, TLO ($p=0.479$). Only ELO value was higher in the nasal polyp group ($p=0.035$).

Conclusions: As in many areas, easier and cheaper diagnostic methods and markers are needed in nasal cavity masses. In our study, we found no evidence that peripheral blood cells could be used to guide the diagnosis and treatment plan of the most common mass lesions of the nasal cavity. Broader and more comprehensive studies are needed for definitive results.

Keywords: Neutrophil, Lymphocyte, Eosinophil, Monocyte, Platelet, Inverted papilloma, Nasal polyposis, Antrochoanal polyp

INTRODUCTION

Nasal polyps are nasal masses, the frequency of which is not known exactly, and is more common in adult males. The factors that trigger the development of nasal polyp are multifactorial and almost all of them are attributed to mucosal edema.¹ Antrochoanal polyps are paranasal pathologies that are more commonly seen in the pediatric age group and present with unilateral nasal obstruction, purulent nasal discharge, snoring, foreign body sensation, odor problems and speech disorders due to oropharyngeal

extension. The most common type of these lesions, starting from the maxillary sinus and extending towards the choana, has not been clarified.² Inverted papilloma is a benign sinonasal tumor the etiology of which is unclear. Because of its high recurrence rate and carcinoma development potential, its diagnosis and treatment are important.³

Neutrophil-lymphocyte ratio (NLR), Eosinophil-lymphocyte ratio (ELO), and Thrombocyte-lymphocyte ratio (TLO) have attracted attention as the markers in

which an interest has been intensified in recent years and numerous studies have been conducted in many fields. Some studies can be used in determining the prognosis of Ear Nose Throat diseases, predicting relapses, and distinguishing between benign and malign.⁴⁻⁶ Similarly, there are studies on nasal polyposis.^{7,8}

In this study, the levels and rates of peripheral blood cells are examined in patients with nasal polyps, antrochoanal polyps, and inverted papilloma, and it is investigated whether peripheral blood elements can be used as a marker in the differential diagnosis of these three pathologies. Our study is the first study in the literature to examine the levels of peripheral blood cells in patients with inverted papilloma.

METHODS

Between January 2015 and December 2018, the files of 70 patients who underwent functional endoscopic sinus surgery and antrochoanal polyp excision with the diagnosis of inverted papilloma, nasal polyps, and antrochoanal polyps in the Department of Otolaryngology of the Recep Tayyip Erdoğan University Medical Faculty Training and Research Hospital were retrospectively reviewed. Endoscopic examination and paranasal computed tomography examinations were performed in all patients before the surgical procedure. Before the study, ethics committee approval was obtained from the Recep Tayyip Erdoğan University Faculty of Medicine Clinical Research Ethics Committee.

Patient files were evaluated in terms of age, gender, pre-operative complete blood count and post-operative histopathological diagnosis, and hematological parameters were recorded. The blood values of the patients taken from the peripheral vein were examined with the Sysmex WE-2100 (Sysmex Corporation, Kobe, Kansai, Japan) device, and the neutrophil, lymphocyte, eosinophil, monocyte, and thrombocyte counts were determined. The NLR value was calculated by dividing the neutrophil number by the lymphocyte number, the ELO value by dividing the eosinophil number by the lymphocyte number, the MLO value by dividing the monocyte number by the lymphocyte

number, the BLO value by dividing the basophil number by the lymphocyte number, and the TLO value by dividing the platelet number by the lymphocyte number. According to clinical examination and histopathological results, they were divided into three groups as inverted papilloma, nasal polyposis, and antrochoanal polyps. Neutrophil, lymphocyte, eosinophil, monocyte and thrombocyte counts, NLR, ELO, MLO, BLO, and TLO values of all these three groups were separately compared statistically.

Patients with autoimmune diseases, acute and chronic infectious diseases other than sinusitis, malignancy, hematological diseases, systemic corticosteroid therapy, and chronic renal failure were excluded from the study.

All statistical evaluations were made by using the Statistical package for social sciences (SPSS) 22.0 software program. Independent sample t-test, one-way analysis of variance test (ANOVA), and Post Hoc Tukey Tests were used for statistical evaluation. A value of $p < 0.05$ was considered statistically significant.

RESULTS

A total of 70 patients, including 24 nasal polyps, 26 antrochoanal polyps, and 20 inverted papillomas, were included in the study. There was no difference in terms of gender in the groups. The mean age of the groups was determined as 44.9, 27.03, and 50.7, respectively. Statistically, the mean age of antrochoanal polyps was lower than the other groups ($p < 0.001$).

There was no statistical difference between the groups in terms of neutrophil, lymphocyte, monocyte, basophil, and thrombocyte counts ($p > 0.05$). However, eosinophil counts were higher in the nasal polyp group than in the antrochoanal polyp and inverted papilloma group ($p = 0.042$).

NLO, ELO, BLO, MLO, TLO values of all three groups are summarized in table 1. There was no statistical difference between the groups in terms of NLR, BLO, MLO, TLO ($p = 0.479$). Only ELO value was higher in the nasal polyp group ($p = 0.035$).

Table 1: Comparison of the peripheral blood element ratios of the groups.

	Nasal polyp	Antrochoanal polyp	Inverted papilloma	P value
NLO	1,8638±0.80516	2.0381±1.07128	1.7146±0.74269	0.479
ELO	0.1419±0.11764	0.0850±0.07323	0.0843±0.04560	0.035
MLO	0.2184±0.07928	0.2436±0.10434	0.2278±0.07098	0.59
BLO	0.0167±0.01049	0.0145±0.00727	0.0160±0.00882	0.657
TLO	120.0521±50.35118	134.9112±31.05814	112.2451±41.30963	0.172

DISCUSSION

The numbers and rates of peripheral blood cells have recently become an area of interest in the detection of inflammatory conditions. The main reasons for these

interest are that it does not cost anything other than a complete blood count and is easily accessible. It is also used in the proportions of other cells, especially the neutrophil-lymphocyte ratio.⁹

Edema seen in nasal polyp is an inflammatory condition caused by cytokines, adhesion molecules, and endothelial receptors. It is the most common inflammatory cell owing to increased cell migration and prolonged lifespan of eosinophils.¹⁰ Consistent with the literature, the number of eosinophils was found to be higher in patients with nasal polyps in our study.

In a study with 240 patients who underwent surgery for nasal polyp, it was found that NLR, ELO, and BLO were significantly higher in patient groups with recurrence.⁷ Yenigün et al in a study conducted with 158 patients with nasal polyps, it was found that preoperative NLR and ELO levels were significantly higher in patients with recurrence after surgery when compared to patients without recurrence. In the light of these data, it has been reported that NLR and ELO can be a helpful method in determining nasal polyp recurrence.¹⁰

Lorenzo et al determined that serum eosinophil levels were found to be significantly higher in patients with nasal polyps when compared to allergic rhinitis linings without nasal polyp. The release of increased mediators causes nasal polyp formation. It is thought that mast cells as well as eosinophils play a critical role in these mechanisms¹. Our results support the eosinophil data in this study.

Levels of peripheral blood components parallel the systemic inflammatory response. Neutrophil lymphocyte ratio (NLR) is used as an inflammatory marker and prognostic factor for many diseases. NLR has been still associated with poor prognosis in many malignancies including head and neck cancers.⁹ In a meta-analysis of head and neck cancers by Tham et al NLR, LMO, and TLO were found to be associated with disease-free survival but not associated with mean survival.¹² In a meta-analysis conducted by Takenaka et al high platelet level and TLO were found to be associated with poor prognosis in head and neck cancers.¹³ In our study, no significant differences were found in patients with NLR, MLO, BLO, and TLO nasal polyps, antrochoanal polyps, and inverted papilloma.

The diagnosis of inverted papilloma is usually made 1-4 years after nasal symptoms occur. Nonspecific nasal obstruction, runny nose, headache, hyposmia or anosmia, nosebleeds, or facial pain are the symptoms that can be seen.³ Pathological examination is essential for the diagnosis of inverted papilloma. Since it may be associated with inflammatory polyps, false negativity can be detected in biopsies.¹⁴

The etiology of inverted papilloma has not been elucidated yet. Even if smoking, allergies, and occupational exposures are introduced, the cause and effect relationship has not been fully elucidated.¹⁵ Although there are contradictions in the literature, there are serious doubts about the role of HPV infection in the pathophysiology in recent years. In a recent meta-analysis by Syrjanen et al. HPV positivity rate was reported as 38%.¹⁶

Due to delays in the diagnosis of inverted papilloma and some patients being asymptomatic, the presence of false positives in biopsies, it has been revealed that it should be used at the stage of diagnosis in other diagnostic and supportive parameters. In the results of this study, there was no evidence that these parameters could be used in peripheral blood cells. Long-term follow-up of patients is required to comment on its usability in determining the recurrence of inverted papilloma patients.

CONCLUSION

As a result, easier and cheaper diagnostic methods and markers are needed in many areas to save both cost and time. Nasal cavity masses also have an important place in this group. In our study, more extensive and comprehensive studies are needed to use peripheral blood cells to guide the diagnosis and treatment plan of the most common mass lesions of the nasal cavity.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Birinci M, Terzi S, Çeliker M, Dursun E. Evaluation of peripheral blood cell levels in nasal polyposis, antrochoanal polyp and inverted papilloma patients. *Int J Otorhinolaryngol Head Neck Surg* 2021;7:1216-9.