

CLINICAL ASSESSMENT OF INFLAMMATORY BLOOD MARKERS IN PATIENTS WITH SINONASAL INVERTED PAPILOMA

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ABSTRACT

Background: The benign neoplasms of the paranasal sinus and nasal cavities known as sinonasal inverted papillomas have a high risk of recurrence and the potential to turn malignant. The purpose of this study was to evaluate the association between Sinonasal inverted papilloma and inflammatory blood markers.

Aim: The study employed a comparison and assessment of inflammatory blood markers, such as platelet distribution width (PDW), mean platelet volume (MPV), red cell distribution width (RDW), platelet–lymphocyte ratio (PLR), and neutrophil–lymphocyte ratio (NLR), in Indian population.

Results: In the research and control participants, the difference in lymphocytes, neutrophils, haemoglobin, platelets, and white blood cells was statistically non-significant with $p>0.05$. Additionally, PDW, MPV, RDW, PLR, and NLR showed statistically non-significant differences between patients and controls ($p>0.05$). Nonetheless, it was shown that a drop in PLR and an increase in NLR were statistically significant variables in the instances.

Conclusion: The study comes to the conclusion that PLR and NLR are useful inflammatory blood indicators that may be used to distinguish people with Sinonasal inverted papilloma from controls. However, in order to draw a broad conclusion, further longitudinal research is required.

Keywords: sinonasal inverted papilloma, neutrophil-to-lymphocyte ratio, mean platelet volume, inflammatory blood indicators

INTRODUCTION

Histological analysis of sinonasal inverted papillomas reveals endophytic development patterns, which are distinctive characteristics of these lesions. Benign growths of the nasal cavity and paranasal sinuses that originate from the Schneiderian epithelium are called sinonasal inverted papillomas.¹ They account for over 4% of all primary nasal neoplasms that have been documented, and they impact a sizable population. Male participants are more likely to have sinonasal inverted papillomas, which impact people in their fifth and sixth decades of life.²

The local aggressiveness, high recurrence risk, and potential for malignant transformation are the key characteristics of Sinonasal inverted papillomas. Data from earlier studies indicate that 50% of cases of Sinonasal inverted papillomas recur.³

Numerous risk factors, such as the surgical method used for the procedure, growth pattern, tumour stage, osseous invasion, tumour location, and histopathologic tumour features, are linked to the high recurrence rate of sinonasal inverted papillomas.⁴ Another explanation for the high recurrence rate is insufficient tumour clearance from the resection site. Sinonasal inverted papillomas have a high risk of malignant change, including invasive squamous cell carcinoma, in addition to a high risk of local recurrence. With Sinonasal inverted papillomas, the malignancy can be metachronous or synchronous, with overall malignancy rates ranging from 7% to 11%.⁵

As of yet, the precise aetiology and pathophysiology of Sinonasal inverted papillomas remain unclear. Several hypotheses proposed that the human papillomavirus (HPV) might be the cause of Sinonasal inverted papillomas. Nevertheless, no clear-cut functions were established, and the hypotheses remained unproven. Histologic evaluation of sinonasal inverted papillomas revealed significant rates of epithelial cell proliferation and downregulation in the suppression of apoptosis. These histologic results led to the belief that Sinonasal inverted papillomas were caused by a malignant process.⁶

Recent substantial literature study on sinonasal inverted papillomas has led to the conclusion that the inflammatory response is crucial to the development and prognosis evaluation of a variety of lesions, both benign and malignant, as well as a number of other disorders. Numerous hematologic parameters, such as the platelet distribution width (PDW), red cell distribution width (RDW), mean platelet volume (MPV), platelet-to-lymphocyte ratio (PLR), and neutrophil-to-lymphocyte ratio (NLR), are simple to measure with high precision and accuracy in order to precisely assess the inflammatory response.⁷

Significant correlations between neutrophil-to-lymphocyte ratio (NLR) and inflammatory diseases have been seen in ulcerative colitis, hepatic steatosis, inflammatory bowel disease, malignancy, and/or diabetes mellitus. Additionally, a correlation has been shown between MPV (mean platelet volume) and thyroid cancer, heart problems, rheumatoid arthritis, functional bowel illness, nasal polyposis, and diabetes mellitus. Inflammatory disorders such as thyroid nodules, autoimmune illnesses, and pathologies of the spinal discs are also associated with an increase in RDW. Diabetes mellitus, hepatosteatosis, and coronary artery disease have all been linked to higher PWD.⁸

The purpose of this study was to evaluate the association between gender and age-matched controls and inflammatory blood markers in patients with sinonasal inverted papilloma.

MATERIALS AND METHODS

The purpose of the current retrospective clinical investigation was to evaluate the association between gender and age-matched controls in an Indian healthcare facility and inflammatory blood indicators in patients with sinonasal inverted papilloma. At the study was conducted. The Institute provided the study's data in a retrospective fashion. Regarding the assessment of the

information gathered for patients with inverted Sinonasal papillomas. Subjects with systemic inflammatory illness, myocardial infarction history, thyroid disease, chronic obstructive pulmonary disease, renal failure, liver failure, pneumonia, acute infection, acute inflammation, and recurring Sinonasal inverted papillomas were excluded from the study. Following their elimination, 130 participants in all, including 130 gender- and age-matched controls without any comorbidities, were included to the research. A week before to the surgical procedure for Sinonasal inverted papillomas, each subject's age, gender, and total blood count were recorded.

The collected data was statistically analysed using the Mann Whitney U-test, student t-test, and SPSS software version 21.0 (IBM, NY, USA). For data that had a normal distribution and non-normal distribution, respectively, non-parametric and parametric tests were employed. The information was presented as a number, percentage, mean, and standard deviation. A significance threshold of $p < 0.05$ was maintained.

RESULTS

Purpose of this retrospective clinical study was to evaluate the association between gender and age-matched controls in an Indian healthcare facility and inflammatory blood indicators in patients with sinonasal inverted papilloma. The study evaluated 130 patients with inverted Sinonasal papillomas, comparing them to age- and gender-matched controls. Table 1 contains a list of the research participants' demographic information. There were 83.07% ($n = 108$) and 16.92% ($n = 22$) men among the controls. In the cases group, a similar gender distribution was seen. With $p=1.00$, this difference was statistically significant. As indicated in Table 1, the mean age of research participants in the cases and controls was 54.6 ± 11.4 years and 53.1 ± 10.4 years, respectively. These values were statistically non-significant with $p=0.36$.

Table 2 illustrates the non-significant statistical differences between the control and case groups for all hematologic parameters in the study subjects. The p-values for PLR, NLR, neutrophil counts, lymphocyte counts, PDW, MPV, RDW, haemoglobin, platelet counts, and WBC counts were 0.32, 0.27, 0.68, 0.06, 0.08, 0.54, 0.82, 0.74, 0.56, and 0.09, respectively.

In contrast to the cases, the controls had greater PLR, while the patients had higher NLR. While neutrophil levels were greater in cases, lymphocyte numbers were higher in controls. In both the cases and the controls, RDW, haemoglobin, and PDW were comparable. WBC, MPV, and platelet counts were greater in cases compared to controls.

The odd's ratio in the logistic regression analysis for PLR was 2.584, with a 95% confidence interval (CI) of 1.255-5.115. The statistical significance was shown by the p-value of 0.007. As indicated in Table 3, the NLR (platelet lymphocyte ratio) had an odd's ratio of 0.966, a 95% confidence interval of 0.954-0.777, and a p-value of 0.37.

DISCUSSION

The purpose of the current retrospective clinical investigation was to evaluate the association between gender and age-matched controls in an Indian healthcare facility and inflammatory blood indicators in patients with sinonasal inverted papilloma. The study evaluated 130 patients

with inverted Sinonasal papillomas, comparing them to age- and gender-matched controls. There were 83.07% (n = 108) and 16.92% (n = 22) men among the controls. In the cases group, a similar gender distribution was seen. With $p=1.00$, this difference was statistically significant. The research individuals' mean age in the case and control groups was 54.6 ± 11.4 years and 53.1 ± 10.4 years, respectively. This difference in age was not statistically significant, with a p-value of 0.36. These demographics were similar to those of the patients evaluated in the earlier research by Wang MJ⁹ in 2016 and Duman TT et al.¹⁰ in 2019, where the authors evaluated people with similar demographics to the current investigation.

When the hematologic parameters of the study subjects were compared to the controls and cases, all of the parameters showed statistically insignificant differences. The corresponding p-values for PLR, NLR, lymphocyte counts, neutrophil counts, PDW, MPV, RDW, haemoglobin, platelet counts, and WBC counts were 0.32, 0.27, 0.68, 0.06, 0.08, 0.54, 0.82, 0.74, 0.56, and 0.09, respectively. In contrast to the cases, the controls had greater PLR, while the patients had higher NLR. While neutrophil levels were greater in cases, lymphocyte numbers were higher in controls. In both the cases and the controls, RDW, haemoglobin, and PDW were comparable. WBC, MPV, and platelet counts were greater in cases compared to controls.

These results were consistent with the previous studies of Aktas G et al¹¹ in 2020 and Sincer I et al¹² in 2018. The authors found that there was no discernible difference between the hematologic parameters of the inflammatory disease individuals and the control group. The study's findings demonstrated that, in the case of PLR, the odd's ratio for the logistic regression analysis was 2.584, the 95% confidence interval (CI) was 1.255–5.115, and the p-value indicated statistical significance at 0.007. The platelet lymphocyte ratio, or NLR, had a p-value of 0.37, an odds ratio of 0.966, and a 95% confidence interval of 0.954-0.777. These results were consistent with research by Liao MJ et al.¹³ and Kara M et al.¹⁴ who found that an increase in NLR and a reduction in PLR were statistically significant variables in their respective instances.

CONCLUSION

The current study suggests, taking limitations into account, that PLR and NLR are useful inflammatory blood indicators that can aid in distinguishing controls from people with Sinonasal inverted papilloma. However, in order to draw a broad conclusion, further longitudinal research is required.

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TABLES

S. No	Characteristics	Controls (n=130) Mean ± S. D	Cases (n=130) Mean ± S. D	p-value
1.	Gender n (%)			

a)	Males	108 (83.07)	108 (83.07)	1.00
b)	Females	22 (16.92)	22 (16.92)	
2.	Mean age (years)	53.1±10.4	54.6±11.4	0.36

Table 1: Demographic data of the study participants

S. No	Characteristics	Controls (n=130) Mean ± S. D	Cases (n=130) Mean ± S. D	p-value
1.	PLR	112.1±39.4	108.7±42.6	0.32
2.	NLR	1.84±0.58	2.2±0.82	0.27
3.	Lymphocyte counts (10 ³ /μL)	2.47±1.91	2.28±0.61	0.68
4.	Neutrophil count (10 ³ /μL)	3.7±0.7	4.6±1.4	0.06
5.	PDW (%)	16.3±0.2	16.2±1.4	0.08
6.	MPV (fl)	8.6±0.7	9.2±1.6	0.54
7.	RDW (%)	13.6±1.2	13.6±1.0	0.82
8.	Hemoglobin (gm/dl)	14.5±1.2	14.4±1.5	0.74
9.	Platelet counts (10 ³ /μL)	239.4±52.4	233.1±52.9	0.56
10.	WBC counts (10 ³ /μL)	7.05±1.32	7.47±1.54	0.09

Table 2: Comparison of laboratory parameters in the two groups of study subjects

S. No		OR	95% CI	p-value
1.	PLR	2.584	1.255-5.115	0.007
2.	NLR	0.966	0.954-0.777	0.37

Table 3: Logistic regression analysis