

Lower Gastrointestinal Tract Characteristics of Non-Hodgkin Lymphoma Maligna at Margono Soekarjo Purwokerto General Hospital: A Retrospective Descriptive Study

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ABSTRACT

Background: Non-Hodgkin lymphoma (NHL) is one of the most common lymphoid neoplasms, frequently presenting with extranodal involvement, including the lower gastrointestinal tract and mesentery. Accurate diagnosis requires integration of clinical data, histopathological features, and immunohistochemical (IHC) markers. However, evidence regarding clinical characteristics and IHC profiles of NHL in these anatomical sites remains limited. Therefore, this study aimed to describe the clinical characteristics and IHC profile (CD20 and CD3) of NHL involving the lower gastrointestinal tract and mesentery at Margono Soekarjo Purwokerto General Hospital during 2022-2024.

Methods: The experiment was conducted using a retrospective descriptive design with secondary data from medical records. The study population included patients diagnosed with NHL of the lower gastrointestinal tract and mesentery, fulfilling inclusion and exclusion criteria. Extracted variables comprised age, sex, residence, tumor site, and IHC results (CD20 and CD3). Subsequently, the data extracted were analyzed using univariate descriptive statistics.

Results: The results showed that 40 patients met eligibility criteria, with the majority being 40–60 years (57.5%) and predominantly men (60%). Tumors were most frequently located in the caecum (32.5%) and mesentery (27.5%), with the majority of patients residing in Banyumas (25%). IHC analysis showed that 37 patients (92.5%) had CD20 positivity, consistent with B-cell NHL, while 3 patients (7.5%) expressed CD3 positivity, indicating T-cell NHL.

Conclusion: Lower gastrointestinal and mesenteric NHL predominantly affected middle-aged men, most commonly involving the caecum, with B-cell type as the predominant subtype.

Keywords: CD3, CD20, Digestive tract, Immunohistochemistry, Non-Hodgkin lymphoma

ABSTRAK

Latar belakang : Limfoma non-Hodgkin (LNH) merupakan salah satu neoplasma limfoid yang sering ditemukan dengan manifestasi ektranodal, termasuk pada traktus digestivus inferior dan mesenterium. Diagnosis LNH memerlukan integrasi data klinis, histopatologi, serta imunohistokimia (IHK). Data mengenai karakteristik klinis dan profil IHK LNH pada traktus digestivus inferior dan mesenterium di Indonesia masih terbatas. Peneliti bertujuan untuk mengetahui karakteristik klinis dan profil IHK (CD20 dan CD3) LNH pada traktus digestivus inferior dan mesenterium di RSUD Prof. Dr. Margono Soekarjo periode 2022–2024.

Metode: Penelitian deskriptif retrospektif data sekunder dari rekam medis. Populasi penelitian adalah pasien LNH traktus digestivus inferior dan mesenterium yang memenuhi kriteria. Data yang dikumpulkan meliputi usia, jenis kelamin, tempat tinggal, lokasi tumor, serta hasil pemeriksaan IHK (CD20 dan CD3). Analisis dilakukan secara deskriptif univariat.

Hasil: Ditemukan 40 pasien yang memenuhi kriteria. Mayoritas pasien (57,5%) berusia 40-60 tahun, jenis kelamin terbanyak laki-laki (60%). Lokasi tumor paling banyak ditemukan pada caecum (32,5%) dan mesenterium (27,5%). Pasien paling banyak bertempat tinggal di Banyumas (25%). Pemeriksaan IHK CD20 dan CD3 LNH ditemukan 37 pasien (92,5%) mengekspresikan CD20 positif pada sel tumor yang menunjukkan asal LNH yaitu sel B. Terdapat 3 pasien (7,5%) yang mengekspresikan CD3 positif pada sel tumor yang diinterpretasikan sebagai LNH sel T.

Kesimpulan: LNH traktus gastrointestinal inferior dan mesenterium paling sering ditemukan pada laki-laki usia paruh baya, terutama di sekum, dengan dominasi tipe sel B.

Kata kunci: CD3, CD20, Traktus Digestivus, Imunohistokimia, Limfoma Non-Hodgkin

INTRODUCTION

Non-Hodgkin lymphoma (NHL) is a hematologic malignancy with a rising global incidence. According to GLOBOCAN 2020, NHL ranks as the 11th most common cancer worldwide and contributes significantly to cancer-related mortality¹¹ This medical condition represents a heterogeneous group of lymphoproliferative disorders involving both nodal and extranodal sites. The gastrointestinal tract is one of the most frequent extranodal sites, accounting for approximately 30–45% of all extranodal NHL cases.¹⁴ However, diagnostic and therapeutic challenges often arise due to the morphological variability and diversity of histopathological subtypes, which cannot be reliably distinguished using routine histology alone.¹⁵ Therefore, immunohistochemistry (IHC) is essential for identifying the cellular origin of lymphoma, particularly distinguishing between B-cell and T-cell lineages.¹

Several international studies have investigated the IHC characteristics of gastrointestinal lymphomas. Reports from Asia and Europe show that B-cell lymphomas have a higher prevalence than T-cell lymphomas. Diffuse large B-cell lymphoma (DLBCL) is the most prevalent subtype, typically showing strong and consistent CD20 expression.¹⁴ Furthermore, anatomical site has been reported to influence IHC expression patterns as well as the distribution of histological subtypes.¹³ These results show the importance of site-specific studies in understanding the biological behavior of NHL.

In Indonesia, large-scale studies indicate that NHL occurs predominantly in men, with the highest incidence among individuals aged 50–59 years. More than half of the cases are extranodal, with approximately 90.6% identified as B-cell lymphomas

(CD20+) and 68.8% classified as DLBCL. Among these cases, approximately 9% of DLBCL involve the colon.⁷ Although most studies have focused on nodal or gastric lymphomas, there are limited reports on the lower gastrointestinal tract.¹³

Currently, comprehensive clinical and immunohistochemical (IHC) data on NHL involving the lower gastrointestinal tract and mesentery are unavailable, particularly in the region served by RSUD Prof. Dr. Margono Soekarjo. This absence of localized data poses challenges in establishing context-specific diagnostic references and developing biomarker-guided clinical management protocols that support precision medicine approaches. Therefore, this study aims to describe the distribution of demographic characteristics, tumor sites, and IHC profiles of NHL in the lower gastrointestinal tract and mesentery at Margono Soekarjo Purwokerto General Hospital.

METHODS

This study was carried out using a retrospective descriptive design. Data were collected from medical and pathological records of patients diagnosed with NHL at Margono Soekarjo General Hospital between January 2022 and December 2024. Cases were identified through the pathology database by retrieving all records of extranodal NHL cases that received IHC examination during the study period.

A total of 205 extranodal NHL cases with available IHC data were identified. Among these cases, 44 involved the lower gastrointestinal tract and mesentery. Cases with evidence of secondary involvement from nodal or other primary sites (n = 4) were excluded based on clinical and pathological records. Consequently, a total of 40 cases met the inclusion and exclusion criteria

and were included in the analysis. All eligible cases during the study period were included using a total sampling method.

Inclusion criteria were patients with histopathologically confirmed NHL involving the lower gastrointestinal tract or mesentery, availability of IHC markers (CD20 and CD3), and complete demographic data. Meanwhile, exclusion criteria were cases with evidence of secondary involvement or inconclusive/non-diagnostic IHC results. The evaluation of IHC was performed using CD20 and CD3 markers to determine B-cell and T-cell lineage. CD20 positivity was defined as membranous staining in neoplastic cells, while CD3 positivity was defined as membranous staining in T-lymphocytes, based on standard pathological interpretation. Cases were classified according to the dominant immunophenotype.

Data were analyzed descriptively using univariate methods to assess the distribution of age, sex, residence, tumor site, and IHC profile. Categorical variables were presented as frequencies and percentages. This study was approved in 2025 by the Margono Soekarjo General Hospital Ethics Committee (Approval No. 420/0874).

RESULTS

During the study period (2022–2024), a total of 205 patients with extranodal NHL who underwent IHC examination were identified. Among these cases, 44 involved the lower gastrointestinal tract and mesentery. After excluding 4 cases with secondary involvement, 40 patients met the inclusion and exclusion criteria and were included in the final analysis.

Table 1 presents the distribution of patients by demographic and clinical characteristics. The majority of cases occurred in individuals aged 40–60 years (23 cases, 57.5%), followed by 61–75 years (10 cases, 25%). Younger patients (<40 years) accounted for 7 cases (17.5%), while no cases were identified in patients >75 years (0%). Based on sex distribution, men represented the highest proportion with 24 cases (60%), while women comprised 16 cases (40%).

In terms of residence, the largest contribution came from Banyumas (10 cases, 25%), followed by Cilacap (8 cases, 20%), Banjarnegara (5 cases, 12.5%), Wonosobo (4 cases, 10%), and Brebes (4 cases, 10%). Smaller case numbers were reported from Pemalang (2 cases, 5%), as well as Purbalingga, Pekalongan, and Tegal (1 case each, 2.5%). An additional 4 (10%) originated from districts outside the main 10 regions and were categorized as “Other.”

Table 1. Demographic and Clinical Characteristics of Patients (N = 40)

No.	Variable	Frequency (\n(n))	Percentage (%)
1.	Sex		
	Women	16	40.00
	Men	24	60.00
2.	Tumor Site		
	Caecum	13	32.50
	Mesentery	11	27.50
	Colon	8	20.00
	Ileum	3	7.50
	Rectum	3	7.50
	Ileocaecal	2	5.00
	Appendix	0	0.00
3.	Age (years)		
	< 40	7	17.50
	40 – 60	23	57.50
	61 – 75	10	25.00
	> 75	0	0.00
4.	Residence		
	Banyumas	10	25.00
	Cilacap	8	20.00
	Banjarnegara	5	12.50
	Wonosobo	4	10.00
	Brebes	4	10.00
	Pemalang	2	5.00
	Purbalingga	1	2.50
	Pekalongan	1	2.50
	Tegal	1	2.50
	Other	4	10.00
5.	IHC Profile		
	CD20 positive (B-cell)	37	92.50
	CD3 positive (T-cell)	3	7.50

Regarding tumor site, the caecum was the most frequent (13 cases, 32.5%), followed by the mesentery (11 cases, 27.5%), colon (8 cases, 20%), ileum (3 cases, 7.5%), and rectum (3 cases, 7.5%). There were no cases reported in the appendix (0%). IHC analysis showed that 37 patients (92.5%) expressed CD20 positivity, indicating B-cell lineage, while 3 (7.5%) were CD3-positive, consistent with T-cell origin.

DISCUSSION

The discussion integrates patient demographics, tumor characteristics, and IHC results to provide a comprehensive interpretation of the results. This study found that most patients with NHL involving the lower gastrointestinal tract and mesentery were men. The result is consistent with global epidemiological data showing that men are more frequently affected by extranodal NHL than women.⁹ Similarly, a 15-year study in Indonesia reported that 51.8% of NHL cases occurred in men.⁷

This study identified the caecum as the most frequent tumor site in NHL of the lower gastrointestinal tract. The result is consistent with previous reports showing high involvement of the ileocaecal site, which is rich in gut-associated lymphoid tissue (GALT) and prone to abnormal lymphoproliferation.⁸ The caecum contains Peyer's and caecal patches with active germinal centers that facilitate antigen sampling and immune activation, predisposing the site to chronic immune stimulation and lymphoid transformation.¹

In this study, most patients with NHL involving the lower gastrointestinal tract and mesentery were aged 40–60 years. Similar findings have been reported in Indonesia, where the majority of NHL cases occurred in patients ≥ 40 years, with the lowest incidence in children under 16 years.¹³

Most patients in this study originated from the ex-Karesidenan Banyumas site, particularly Banyumas and Cilacap, with fewer cases from surrounding districts. This geographic distribution shows a combination of environmental and structural factors. As Margono Soekarjo General Hospital serves as the main tertiary referral center for southwestern Central Java, the higher proportion of cases from Banyumas is influenced by referral patterns and the hospital's catchment site.¹² Differences in healthcare access, including availability of specialized diagnostic services and socioeconomic barriers in more distant districts, can also contribute to the observed distribution, consistent with results from other low- and middle-income countries in Southeast Asia.^{5,10}

Although environmental exposures such as pesticides and organic pollutants have been associated with NHL in previous epidemiological reports,^{2,3,6,9} this study does not include patient-level exposure data. Therefore, the potential contribution of influencing factors to the observed geographic pattern should be interpreted with caution and considered as a hypothesis for future studies rather than a definitive explanation.

In this study, IHC evaluation was performed using CD20 and CD3, which served as pan-B and pan-T markers, respectively.⁴ Consistent with national and international data, the majority of NHL cases in this cohort were of B-cell origin. Previous studies in Indonesia reported similar results, with 90.6% of cases at RSCM Jakarta and the majority at RSUP Dr. Hasan Sadikin Bandung identified as B-cell lymphomas.^{7,13}

CONCLUSION

In conclusion, this study shows that NHL of the lower gastrointestinal tract and mesentery at Margono Soekarjo Purwokerto General Hospital during 2022–2024 occurs most frequently in middle-aged men, with the caecum as the predominant tumor site. The majority of cases are classified as B-cell NHL.

LIMITATIONS

Despite the significant contribution, this study has several limitations. These include the relatively small sample size, which can limit the statistical power and generalizability of the results. Due to the rarity of NHL involving the lower gastrointestinal tract and mesentery, the available cases represent a substantial proportion of the target population at the study center. The single-center design also introduces bias and limits the external validity of the results. Another limitation is the use of only CD20 and CD3 markers, which restricts detailed immunophenotypic subclassification of lymphoma cases. As a descriptive exploratory study, the results are intended to provide an initial characterization of clinical features and IHC profiles rather than to establish causal relationships or definitive prevalence estimates. Therefore, future studies with larger, multicenter cohorts and more comprehensive IHC panels are recommended to validate and expand the results.

CONFLICT OF INTEREST

The authors declare that there are no competing interests.

FUNDING

This study did not receive external funding.

AUTHOR CONTRIBUTION

P.N. conceived the study, collected and processed the data, and drafted the manuscript; H.S. conceived the study, designed the study, and provided input on data analysis and discussion; L.T. contributed to providing clinical relevance input and assisted in drafting the manuscript; M. contributed to the study design and assisted in drafting the manuscript. G.N. conceived the study, designed the study, and provided input on data analysis and discussion.

ACKNOWLEDGMENTS

The authors are grateful to the Department of Pathology, Margono Soekarjo General Hospital, for their assistance in providing access to medical records and immunohistochemistry data. Furthermore, the authors are grateful to the supervisors and colleagues for the valuable suggestions and constructive feedback contributed throughout the course of this study.

DATA AVAILABILITY

The data are not publicly available due to ethical and privacy considerations but can be shared in anonymized form upon reasonable request to the corresponding author.

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