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HISTOPATHOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY OF HODGKIN'S LYMPHOMA- AN INSTITUTIONAL STUDY

Pathology

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ABSTRACT

Hodgkin's lymphoma Comprise approximately 20-30% of all malignant lymphoma. It has bimodal age distribution. IHC markers CD30 and CD15 are key markers to typify the Hodgkin's lymphoma. In the present study our aim is to study the role of IHC markers in Hodgkin's lymphoma. 200 cases of Hodgkin's lymphoma were recruited during August 2015 to April 2017 and differentiated in to subtypes basing upon histopathological features and immunohistochemistry. Classical Hodgkin's lymphoma was found to be the common type, mixed cellularity subtype was found to be the most common subtype among classical Hodgkin's lymphoma. CD15 and CD30 was found in almost all classical Hodgkin's lymphoma. CD30 was more specific for Hodgkin's lymphoma. Our study indicates that IHC has key role to diagnose Hodgkin's lymphoma.

KEYWORDS

Hodgkin's lymphoma, CD15, CD30, Immunohistochemistry

1. INTRODUCTION:

The Malignant Lymphomas can be divided into two major categories (according to WHO 2008) Hodgkin's lymphoma And Non Hodgkin's lymphoma. Hodgkin's Lymphoma is described by Thomas Hodgkin's in 1832 [1,2,3,4]. The definition of Hodgkin's lymphoma – is that of a type of malignant lymphoma in which Reed–Sternberg cells are present in a 'characteristic background' of reactive inflammatory cells of various types, accompanied by fibrosis of a variable degree. Thus identification of typical Reed–Sternberg cells is necessary for the initial diagnosis of Hodgkin's Lymphoma (except for NLPHL). Hodgkin's Lymphoma encompasses two distinct types of disease that differ in etiology, epidemiology, clinical features, pathology and prognosis. They are designated classical Hodgkin's Lymphoma, which constitutes about 98.5% of the cases, and nodular lymphocyte-predominant HL (NLPHL), which constitutes only about 1.5% of the cases. Classical Hodgkin's Lymphoma is further subdivided into lymphocyte-rich (LR), mixed cellularity (MC), nodular sclerosis (NS) and lymphocyte-depleted (LD) subtypes on the basis of the ratio between neoplastic cells and reactive cells, the specific cytological features of the neoplastic cells and the presence or absence of fibrous bands in the affected lymph nodes.

Aim was to investigate the role of IHC in Hodgkin's lymphoma.
We have taken 200 cases of HL. IHC was performed on these cases.

Antibodies against CD15 and CD30 are often used to support morphological diagnosis of HL. The classical HL is CD15 and CD30 positive in general. However, the results for CD15 are less clear-cut in many studies, showing up to 40% of classical HL that lack positivity for this marker[5] Lack of CD15 expression in classical HL is an independent negative prognostic factor for relapses and survival. Therefore, immunohistochemistry (IHC) is able to identify classical HL cases with unfavorable clinical outcome.[6] CD30 is very useful for the diagnosis of classical HL as it is almost always positive, yet from the prognosis point of view it would not give much information.[7] CD30 is a cell membrane protein of the tumor necrosis factor receptor family; it is expressed by activated T and B cells. It is a positive regulator of apoptosis, and also has been shown to limit the proliferative potential of autoreactive CD8 effector T cells and protect the body against autoimmunity. CD30 is associated with anaplastic large cell lymphoma, in embryonal carcinoma and on classical Hodgkin Lymphoma cells. However, as the clinical presentation and histopathological picture is distinct for each, then staining with CD30 can be considered pathognomonic for HL in the proper settings.[5]CD15 is characteristic, but not specific, for RS cells because it can be detected, although rarely, in B and T cell lymphomas and in non-lymphoid tumors[5]. So, here in this study we can see CD30 is more specific than CD15.

2. Methodology

The study was conducted in Department of Pathology, Gujarat Cancer And Research Institute, Ahmedabad, India. The aim of study to typify Hodgkin's lymphoma. 200 Biopsy specimens of lymphnodes were received from August 2015 to April 2017, in Tertiary care hospital. All age and sex groups were included in this study. Any patient who refused to be included in the study protocol was excluded. Detailed clinical history, general and systemic examination, radiological investigations and other lab investigations were obtained from the patient's data records. The study excludes the cases which have insufficient biopsy material, inconclusive immunohistochemistry, improper history, cases on which immunohistochemistry was not given, cases with only slide submission without block for review, cases with crushing on which immunohistochemistry was not possible. All the lymphnode biopsies were formalin-fixed, paraffin embedded and cut into 4-5 micron sections and stained with hematoxylin and eosin stain with special stains when required and based on morphology diagnosis of HL was made primarily. On paraffin embedded blocks CD15 and CD30 monoclonal antibody (DAKO) was given along with other IHC markers like CD45 (LCA), CD20. CD30 and CD15 were considered reactive if the Reed– Sternberg cells or their variants showed intense cytoplasmic and/or paranuclear or membranous staining.

3. RESULTS:

In this study 200 new cases of Hodgkin's lymphoma were diagnosed at our institute between August 2015 to April 2017. The frequency of occurrence of classical Hodgkin's lymphoma is higher than Nodular lymphocyte predominant Hodgkin's lymphoma[8,9]. Table 1 shows the distribution of type of Hodgkin's Lymphoma. Table 2 shows the frequency of various histological subtypes of Classical Hodgkin's Lymphoma in the study. In Classical Hodgkin's Lymphoma, Mixed Cellularity (70.5%) was most common subtype and Lymphocyte Depleted was least occurring subtype.[9,10,11,12]. For all cases IHC was given mainly CD15 and CD30 along with CD45 and CD20. CD30 was given in all 200 cases and CD15 was given in 145 cases of HL. CD30 was positive in 194 (98.47%) cases of Classical Hodgkin's Lymphoma and CD15 was given in 145 cases and it was positive in 138 (95.17%) cases of Classical Hodgkin's Lymphoma [13,14]. CD30 was more specific then CD15 for diagnosing Hodgkin's Lymphoma. 3 Cases of NLPHL were negative for CD15 and CD30 with positive results of CD45 and CD20.

Table 1: Distribution of types of Hodgkin's Lymphoma (N=200)

Sr. No.	HL Type	No. of cases	Percentage (%)
1	Classical	197	98.5%
2	NLPHL	3	1.5%
Total		200	100%

Table 2: Comparison of relative frequency of various histological subtypes of classical Hodgkin's lymphoma

Sr. No.	Histopathological subtype	No. of cases	Percentage (%)
1	Mixed cellularity	141	70.5%
2	Nodular sclerosis	14	7%
3	Lymphocyte depleted	4	2%
4	Lymphocyte rich	38	19%

Table 3: Immunoreactivity of CD15 and CD30 in Hodgkin's lymphoma

Sr. No.	IHC marker	No. of positive cases	Percentage (%)	No. of negative cases	Percentage (%)	Not done
1	CD15	138/145	95.17%	7	4.8%	52
2	CD30	194/197	98.47%	3	1.5%	0

4. CONCLUSIONS AND DISCUSSION

Like many other disease Hodgkin's lymphoma also shows geographical variations in natural history, clinical presentation and histological subtypes. In the present study the frequency of occurrence of classical Hodgkin's lymphoma is higher than Nodular lymphocyte predominant Hodgkin's lymphoma, which is comparable to other studies. Among the 200 patients enrolled 146 (73%) were males and 54 (27%) were females. The male to female ratio was 2.7:1. Maximum patients were belonged to the age group of 11-20 years, followed by 21-30 years, followed by 41-50 years. Among classical Hodgkin's lymphoma Mixed Cellularity was the most common subtype followed by lymphocyte rich, followed by nodular sclerosis, followed by lymphocyte depleted. In Hodgkin's lymphoma nodal involvement was more common than extra nodal involvement. In nodal involvement cervical lymphnodes were most common to be affected. In extra nodal Hodgkin's lymphoma, bone marrow was most common site of involvement.

Only 3 cases of NLPHL among 200 cases were noted.

Immunohistochemistry in Hodgkin's lymphoma show immune reaction for both CD15 and CD30, however CD30 was more specific for Reed Sternberg cells than CD15.

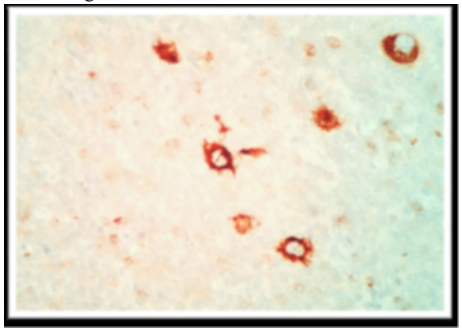

Fig:1: CD30 in RS cells

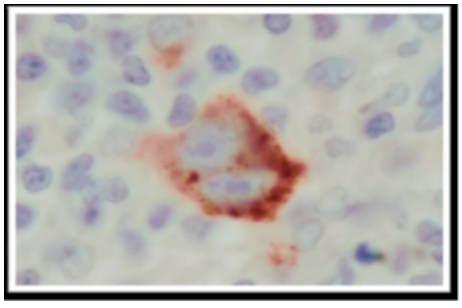

Fig:2: CD15 in RS cells

All cases of Hodgkin's Lymphoma should undergo immunophenotypic analysis for CD15 and CD30.

Immunohistochemistry is required for confirmation and typing of Hodgkin's lymphoma. Single immunohistochemistry marker is not sufficient for confirmation of diagnosis. It is the panel of appropriate markers according to morphology are required for typing and confirmation of diagnosis.

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