

Distribution of Follicular Dendritic Cells in Normal and Infected Appendix By Immunohistochemistry

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ABSTRACT

Background: This study was conducted to observe the distribution of Follicular dendritic cells in normal and infected Appendix by immunohistochemistry.

Subject and Methods: The study was conducted on 100 Male and Female Appendix (75 infected and 25 Normal).

Results: After preparing the slides according to histopathological diagnosis, in the normal appendix the CD 35 positive Follicular Dendritic Cells are found only in Germinal center of Lymphoid Follicles And in infected Appendix CD 35 Positive cells are found in Different layers of Appendix.

Conclusion: CD35 Positive Follicular Dendritic Cells are found In scattered pattern And Distribution In All layers of Appendix.

Keywords: Appendix, Follicular Dendritic cells, Humoral immunity, Germinal Centers.

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Article History:

Received: 12-06-2021, Revised: 04-07-2021, Accepted: 27-07-2021

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2021.7.4.020	

INTRODUCTION

Human Appendix is a Component of Gut Associated Lymphoid Tissue (GALT). Follicular Dendritic Cells are specialized cells residing primarily with in lymphoid follicles.¹ These cells Play a Pivotal Role in Antigen Presentation in Mucosal immune system. Follicular DCs are a non-migratory population found in primary and secondary follicles of the B cell areas of lymph nodes, spleen, and mucosa associated lymphoid tissue (MALT).

FDCs form a stable network due to intercellular connections between FDCs processes and intimate interaction with follicular B cells. Follicular DCs network typically forms the center of the follicle and does not extend from the follicle to the inter follicular regions or T- cell zone. FDCs have high expression of complement receptors CR1 and CR2 (CD 35 and CD 21 respectively².

FDCs play a central role in events related to humoral immunity in lymphoid follicle. They are specialized cells found only within lymphoid follicles. They are non-phagocytic cells, lacking phagosomes and typical phagocytic enzyme, lysosome in their cytoplasm³. Follicular dendritic cells are stromal cells residing in primary follicles and in germinal centers of secondary and tertiary lymphoid organs. FDCs play a crucial role in B-cell activation and affinity maturation of antibodies⁴.

FDCs have the unique capacity to bind and retain native antigen in B-cell follicles for long periods of time. Therefore, FDCs shape

the B-cell antigenome (the sum of all B-cell antigens) in Secondary and Tertiary lymphoid Organs, The Most widely used markers of FDCs are CD21, CD 23 and CD 35 antibodies⁵

SUBJECTS AND METHODS

Total number of samples-100 (75 infected and 25 are normal appendix)

The specimens of human appendix used for study obtained from department of pathology, mahatma Gandhi medical college Jaipur All the specimens preserved in 10% formalin solution and immunohistochemistry procedure applied with mouse antihuman monoclonal CD 35 marker using polymer HRP detection system which detect the follicular dendritic cells.

RESULTS

According To histo-pathological diagnosis, the immunohistochemistry method was used for detecting the Distribution of CD 35 Positive Follicular Dendritic Cells in normal and infected appendix .

DISCUSSION

Trapping of antigen by FDCs as immune complexes is thought to play a crucial role in the generation of memory B lymphocytes during germinal centre reactions (Klaus et al., 1980).

Table 1: Cases of Histopathology

Histopathological diagnosis	Number of Histopathological Diagnosis
Acute Appendicitis	52
Acute Appendicitis with peri appendicitis	5
Acute Gangrenous appendicitis with peri.app.	1
Acute necrotizing Appendicitis	2
Acute on chronic	1
Acute suppurative Appendicitis	1
Appendicular lump	1
Appendicular Perforation	1
Carcinoid Appendix	1
Chronic Appendicitis	1
Gangrenous Appendicitis	1
Hyperplasia	1
Mild acute appendicitis	2
Mild reactive	1
Reactive Hyperplasia of Lymphoid follicles	1
Recurrent Appendicitis	1
Resolving Appendicitis	2
Right hemicolectomy (Normal Appendix)	25
Total	100

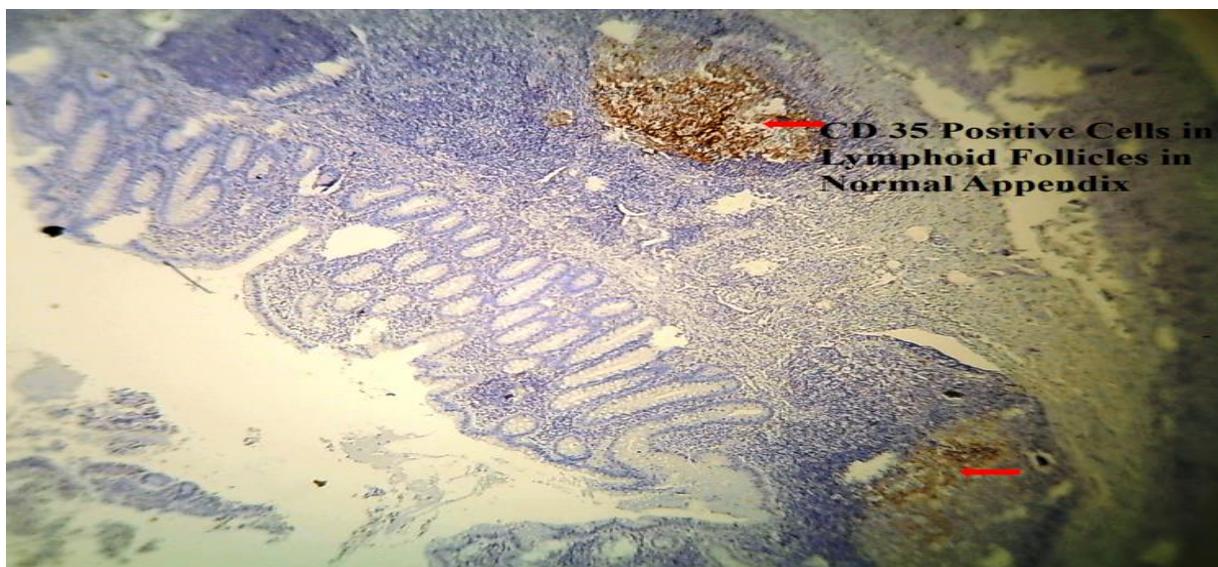


Fig 1: -CD35 Positive (Brown staining cells) FDCs are seen in lymphoid follicles only.

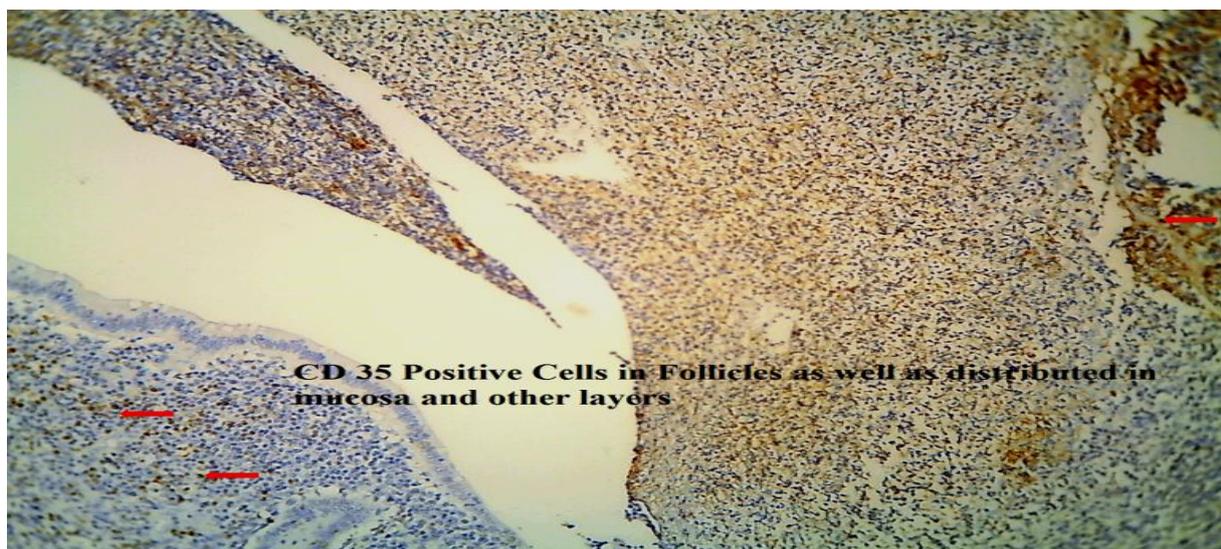


Fig2: In acute Appendicitis FDCs Are Seen In Mucosa And Other Layers

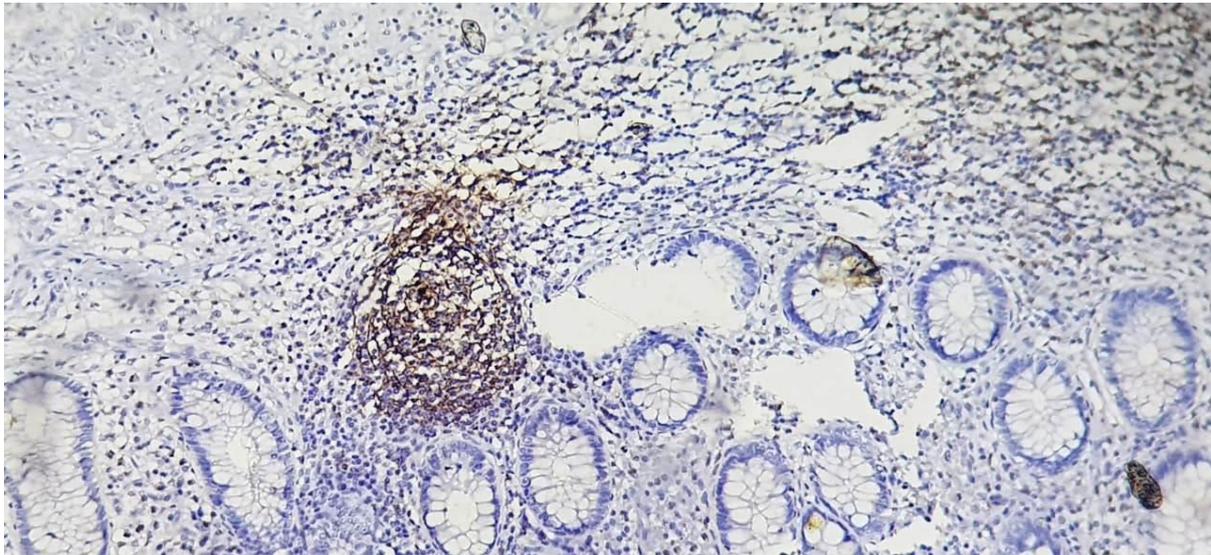


Fig 3: In Acute Appendicitis FDCs are Seen in Scattered pattern in Lamina propria

Antigens are trapped on the surface of the FDCs as immune complexes and are retained for very long periods (Nossal et al., 1964). Follicular dendritic cells play a central role in humoral immunity in the lymphoid follicle (Tew et al., 1982). The dendrites of FDCs intertwined to form a network called the antigen-retaining or FDC-reticulum (Imai et al., 1986)

The major constituents of germinal centres of the lymphoid follicles are activated B cells, tangible body macrophages, T lymphocytes and FDCs (Butcher et al., 1982; Stein et al., 1982).

They bind immune complexes and present antigen to follicular B cells, and aid in the generation of B-cell memory (Heinen et al., 1984). Two types of FDC had been reported (Imai et al., 1986; Rabi et al., 2006). It had been shown in the ageing mouse, that in the absence of antigen presenting cells, immunological recognition and appropriate maturation of B cells into both memory as well as into immunoglobulin secreting cells do not occur (Tew et al., 1989). Binding of immune complexes to FDCs is complement-mediated (Klaus and Humphrey, 1977). Allowing B cells to endocytose, process and present antigens to CD4 T lymphocytes (Dubois et al., 1999). Double immunostaining with CD20 revealed that CD20 positive B cells were seen within the follicles, around the follicles, in the interfollicular area and in the lamina propria of appendix. They express abundant co-stimulatory and adhesion molecules needed for T cell interactions. They also express HLA-DM and HLA-DO, which contribute to peptide loading onto MHC-II molecules (Trombetta and Mellman, 2005). Rabi et al. (2006) reported two types of dendritic cells in the lymphatic follicles of appendix using zinc iodide osmium as the marker. The cells in the germinal centre were larger in size with fewer thick dendritic process, while the ZIO positive cells in the mantle zone were smaller in size with many thin dendritic cells

CONCLUSION

In this study, the CD35 Positive Follicular Dendritic Cells Are Found Only In Germinal Center of lymph nodes in normal appendix, But In the Infected appendix The CD 35 Positive Follicular Dendritic Cells Are Found in All Layers i.e. Lamina Propria, Mucosa, submucosa, Muscularis And Periappendicular tissues. Follicular dendritic Cells are associated with the B cells so FDCs play an important role in improve the immunity.

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Source of Support: Nil.

Conflict of Interest: None Declared.

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Cite this article as: Ankur K. Bichhwaliya, J. M. Sharma, Santosh Kumar, Abhilasha Maharshi. Distribution of Follicular Dendritic Cells in Normal and Infected Appendix By Immunohistochemistry. *Int J Med Res Prof.* 2021 July; 7(4): 88-90. DOI:10.21276/ijmrp.2021.7.4.020