ELECTRON MICROSCOPY IN LUPUS NEPHRITIS (A Case Report)

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ABSTRACT

A female patient aged 8 years presented with mild proteinuria and microscopical haematuria. The serological markers and histological findings in renal needle biopsy were inconclusive. Ultrastructural study revealed features of lupus nephritis. Case is presented to elucidate value of electron microscopy in such cases.

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KEY WORDS : Lupus nephritis; Ultrastructure.

Introduction

Systemic lupus erythematosus (SLE) is an archetype of immunologically mediated disease and is representative of a multisystem disorder in which renal involvement is very common [1]. Lupus nephritis is seen in almost all patients with SLE though only half of them develop clinical nephritis characterised by persistent mild proteinuria, microscopic haematuria and cylinduria [1,2]. The incidence of lupus nephritis varies with the criteria used to identify the renal lesions [3]. Various studies have reported renal disease as a manifestation of SLE in 2.9 to 6% cases [4]. Though lupus nephritis has been documented for well over sixty years, application of newer techniques like electron microscopy (EM) and immunofluorescence (IF) have come into vogue only during the recent past which have helped in its detection, management and prognosis.

CASE REPORT

Eight years old female patient presented with fever, weight loss, anorexia, pain in joints and puffiness of face of three months duration. Investigations revealed a mild normochromic normocytic anaemia, proteinuria and microscopical haematuria. With a clinical diagnosis of SLE, she was further investigated. However, the serological

markers and renal needle biopsy were inconclusive. The biopsy tissue was subjected to ultrastructural evaluation which showed presence of subendothelial electron dense deposits, loss of foot processes and increased number of lysosomes in the disorganised tubular epithelial cells (Figs. 1, 2 & 3). These features favour the diagnosis of lupus nephritis.

Fig. 1 Basement membrane showing subendothelial electron dense deposits. x 19000

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Fig. 2 Basement membrane showing fusion of foot processes. x 10000

Fig. 3 Increase in the number of lysosomes in disorganised tubular epithelial cells. x 14000

Discussion

Lupus nephritis is seen in most cases of SLE. The clinical manifestations are protean and the presence of high anti DNA titre with hypocomplementaemia increases the risk of development of nephritis. It is documented that renal involvement in SLE is seen ultrastructurally even in those cases where overt

clinical disease is not discernible. There is a preponderance in those who are less than 30 years of age. Amongst adults, females are affected more while a male preponderance is noted among children and adolescents [2]. Prognostication and treatment modalities depend to a great extent on the nature of the underlying renal lesion, especially the class, activity of the morphologic disease, extent and severity of glomerulosclerosis and interstitial fibrosis. The ultrastructural examination also serves to prognosticate the course of the disease as seen by the changing histologic pattern.

The electron microscopic features observed are :

(i) *Electron dense deposits (EDD)* : The EDD may be seen in subepithelial, subendothelial, mesangial or peritubular regions. The subendothelial location of EDD is associated with severe progressive disease, while the subepithelial and mesangial deposits are associated with less severe form of disease. Presence of EDD concomitantly in all three locations is not seen in conditions other than lupus nephritis. The finger print pattern is EDD, cryoglobulin in nature, with light and dark bands, found in subendothelial and mesangial region as well as in capillaries of peritubular region. These are stacks of 2 to 6 curved electron dense bands of varying length and diameter seen only in cases of lupus nephritis [3,5,6].

(ii) *Microtubular structures* : Gyorkey [7] in 1969 described microtubular structures which on cross section resembled myxovirus particles. These were found in the endothelial cells of glomeruli of lupus nephritis patients. It is thought to be combination of phospholipid and acidic glycoproteins derived from cytoplasmic degeneration.

(iii) *Haematoxylin bodies* : Mesangial cells participate in the incorporation and digestion of immune deposits and development of haematoxylin bodies. This is pathognomonic of lupus nephritis. These are small lilac bodies seen in the mesangium. Ultrastructurally it is composed of degenerated nuclear material

and a wide variety of cytoplasmic elements including membranes, degenerating mitochondria and vesicles, all of which are within a very thin membrane enclosure [3].

(iv) *Lysosomes and foot processes* : An increase in the number of lysosomes in the disorganised tubular epithelial cells and fusion of foot processes are also features often observed in lupus nephritis [8].

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