Section A

101/A

Distribution of α1 subunits of nicotinic acetylcholine receptors in lymphoid tissues of Balb/C mice and humans: a comparative study

M Thayabaran[1*], S G Yasawardene[2]

[1]*Department of Human Biology, Faculty of Health-Care Sciences, Eastern University of Sri Lanka*
[2]*Department of Anatomy, Faculty of Medical Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda*

The cholinergic innervation of lymphoid organs, through autonomic nerves is not well understood. Several nicotinic acetylcholine receptor (nAChR) subunits were identified in mononuclear lymphocytes of humans, though the specific subtypes of nAChR and their distribution in lymphoid tissue is still debatable. This study was conducted on lymphoid tissues of humans and Balb/C mice to localize and compare the distribution of α1 subunit of nAChR by immunohistochemistry. The tissues were processed for Hematoxylin & Eosin staining and indirect immunohistochemistry. The tissues were labeled by monoclonal anti-nAChR (α1 subunit) and linked to biotinylated anti-rat IgG. Labeled StreptAvidin Biotin technique was used with DiaminoBenzedene (DAB) as chromogen to detect the receptors by the development of brown colour. Skeletal muscle was used as positive control of α1nAChR. The microscopic images were computerized and digital image analysis was performed on immunostained slides. The intensity of the staining was determined based upon a score of 0, 1+ (focal staining, > 10% cells), 2+ (focal to diffuse staining, 10% > 50% cells), 3+ (diffuse staining, 50>100% of cells).

The capsule and red pulp areas of spleen were highly immunoreactive to anti-α1 nAChRs in both species while, low grade immunoreactivity (IR) was observed in peri-arteriolar lymphoid aggregations and germinal centres. A high IR of α1 nAChR were recorded closer to central venules of liver in mice while a similar, diffused (1+) distribution of α1 AChR were observed in the hepatocytes and portal tract of both species . Similar intermediately diffused IR of α1 nAChR was observed in the Peyers patches in both species. Overall the α1 nAChR IR was high in regions predominantly having T cells and macrophages, such as subscapsular sinus, medullary cords & trabeculae of lymph nodes, and an intermediate to low IR was present in the regions having B cell subsets of both lymphoid tissues. These findings confirm that the neuroimmune modulation could be brought by the presence of neuronal cholinergic nerves in lymphoid tissues in both species depending on the distribution of α1 nAChR. Further investigations need to be carried out using antibodies available for different nicotinic and muscarinic receptor subunits, vesicular acetylcholine transporter protein and several components of acetylcholine synthesis for clear understanding of neuro-immune modulation.

*mythreye_t@yahoo.com Tel: 0774940534