Arachnoiditis is chronic inflammation of the arachnoid layer of the meninges which consists of trabeculae, a mesh of interwoven collagen fibrils resembling tissue paper.

These are in contact with the spinal fluid, (CSF), which circulates through the cerebrospinal axis.

The initial phase of the inflammatory process involves influx of white blood cells in response to an insult to the subarachnoid space, e.g. an agent such as blood (trauma, surgery), a foreign substance (dye, etc) or an infectious agent (e.g. meningitis).

This is initiated via the action of cytokines, (proteins that act as immune modulators). There is infiltration by macrophages and mesenchymal cells; the latter transform into fibroblasts, which make collagen (scar tissue).

Usually the fibrinolytic process, which breaks down excess scar tissue, limits this, but in arachnoiditis the scar tissue persists.

Authors such as Jayson ([i]) have suggested that there may be a defect in the fibrinolytic pathway.

A variability in immune response to either the agent causing the injury to the arachnoid membrane or to the injury itself could help to explain why apparently only a minority of patients with arachnoiditis develop the condition to a clinically significant degree.

Agents that trigger inflammation within the arachnoid membrane include exogenous substances such as myelogram dyes, steroid preparations etc. and also, importantly, blood, which is highly irritant.

Blood in the subarachnoid space, from a variety of causes including subarachnoid haemorrhage, can alone precipitate reaction that leads to arachnoiditis.

Indeed, expert Dr. Antonio Aldrete in his book, "Arachnoiditis: The Silent Epidemic" ([ii]) devotes an entire chapter to this problem.

IMMUNE MEDIATORS

- Interleukins
- Tumour necrosis factor ; cytokines
- Prostaglandins
- Nitric oxide

Recent studies ([iii]) have shown the involvement of matrix metalloproteinases in neuroinflammation in conditions such as multiple sclerosis, meningitis, brain tumours etc.

Matrix metalloproteinases (MMPs) are a gene family of proteases important in normal development, wound healing, as well as a number of pathological processes, such as the spread of metastatic cancer cells, arthritic destruction of joints, atherosclerosis, and neuroinflammation.

They have complex roles including release of growth factors, and are important in cell survival

and death.

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[i] Jayson MI, Keegan A, Million R, Tomlinson I Lancet 1984 Nov 24; 2(8413): 1186-7 A fibrinolytic defect in chronic back pain syndromes.

[ii] Aldrete JA Arachnoiditis: The Silent Epidemic, 2000 JGH Editores.

[iii] Rosenberg GA. *Neuroscientist* 2002 Dec; 8(6):586-95 Matrix metalloproteinases and neuroinflammation in multiple sclerosis.Rosenberg GA. *Glia* 2002 Sep; 39(3):279-91 Matrix metalloproteinases in neuroinflammation.