The assembly of the five late components of the complement system leads to the formation of the terminal complement complex (TCC) that inserts into the membrane of the target cells as membrane attack complex causing lysis. However, the cytolytic activity is one of the several functions exhibited by the complex, and probably not the most important one due to the efficient control exerted by several regulators acting both in the fluid phase and on the cell membrane. A wealth of data has been collected over the last two decades indicating that this complex may exhibit non-cytotoxic effects on different cells both in the sublytic and the non cytolytic forms. There is clear evidence that TCC is a potent pro-inflammatory complex acting on endothelial cell and phagocytic cells. The critical role of the late complement components in the host defense is emphasized by the increased susceptibility of individuals with inherited deficiencies of these components to meningococcal infections. Besides the protective functions, TCC may also contribute to tissue damage in several pathological conditions associated with unrestricted complement activation. Efforts are now being made by several groups to develop therapeutic strategies to control the undesired effects of TCC using neutralizing antibodies against these components [1].

The complement system is a crucial part of innate immunity. Recent work demonstrated an unexpected contribution to tissue homeostasis and degeneration. A study investigated for the first time, in human intervertebral disc tissues, the deposition profile of the complement activation product terminal complement complex (TCC), an inflammatory trigger and inducer of cell lysis, and its inhibitor CD59, and their correlation with the degree of disc degeneration (DD).

Methods: Disc biopsies were collected from patients diagnosed with DD (n = 39, age 63 ± 12) and adolescent idiopathic scoliosis (AIS, n = 10, age 17 ± 4) and compared with discs from healthy Young (n = 11, age 7 ± 7) and Elder (n = 10, age 65 ± 15) donors. Immunohistochemical detection of TCC and CD59 in nucleus pulposus (NP), annulus fibrosus (AF) and endplate (EP) was correlated with age, Pfirrmann grade and Modic changes.

Results: Higher percentage of TCC+ cells was detected in the NP and EP of DD compared to Elder ($P < 0.05$), and in the EP of Young versus Elder ($P < 0.001$). In DD, TCC deposition was positively correlated with Pfirrmann grade, but not with Modic changes, whereas for Young donors, a negative correlation was found with age, indicating TCC's involvement not only in DD, but also in early stages of skeletal development. Higher CD59 positivity was found in AIS and DD groups compared to Young ($P < 0.05$), and it was negatively correlated with the age of the patients.

Conclusion: TCC deposition positively correlated with the degree of disc degeneration. A functional relevance of TCC may exist in DD, representing a potential target for new therapeutics [2].

1)
https://link.springer.com/chapter/10.1007/1-4020-8056-5_6
2)
Teixeira GQ, Yong Z, Goncalves RM, et al. Terminal complement complex formation is associated with intervertebral disc degeneration [published online ahead of print, 2020 Sep 16]. Eur Spine J. 2020;10.1007/s00586-020-06592-4. doi:10.1007/s00586-020-06592-4