Rituximab dosing and monitoring strategies in neuromyelitis optica patients: creating strategies for therapeutic success.

Neuromyelitis optica (NMO) is an autoimmune condition that predominantly causes severe optic neuritis and transverse myelitis. Rituximab therapy has dramatically improved patient care, but standardized dosing regimens and guidelines are lacking. The objective of this study was to define a rituximab dosing strategy for NMO patients that achieves the lowest rate of relapses. This was a retrospective chart review of patients treated with various doses of rituximab. Combining data from the NMO and multiple sclerosis (MS) patients, identified that the mean number of days after a 100 mg dose of rituximab until the CD19 population was greater than 2% was 99 days (standard deviation 36, range 43-172). When allowed to rise, the mean number of days after a 1000 mg dose of rituximab until the CD19 population was greater than 2% was 184 (standard deviation 72, range 52-288). The median number of days until a CD19 percentage of 2% was achieved was 133 days in the 100 mg dosing arm and 259 days in the 1000 mg dosing arm. Analysis of the survival curves via both the Mantel-Cox log-rank test and the Wilcoxon test determined that the difference between medial survival for 100 and 1000 mg doses was statistically significant with p-values<0.0001. Low doses of rituximab have a high rate of early
B-cell repopulation. Any NMO patient treated with rituximab should be followed with monthly CD19 counts in order to identify the rare, but clinically significant, early repopulators.