Mortality Estimates in Patients with Anti-aquaporin-4 Autoantibody Positive Neuromyelitis Optica Spectrum Disorder

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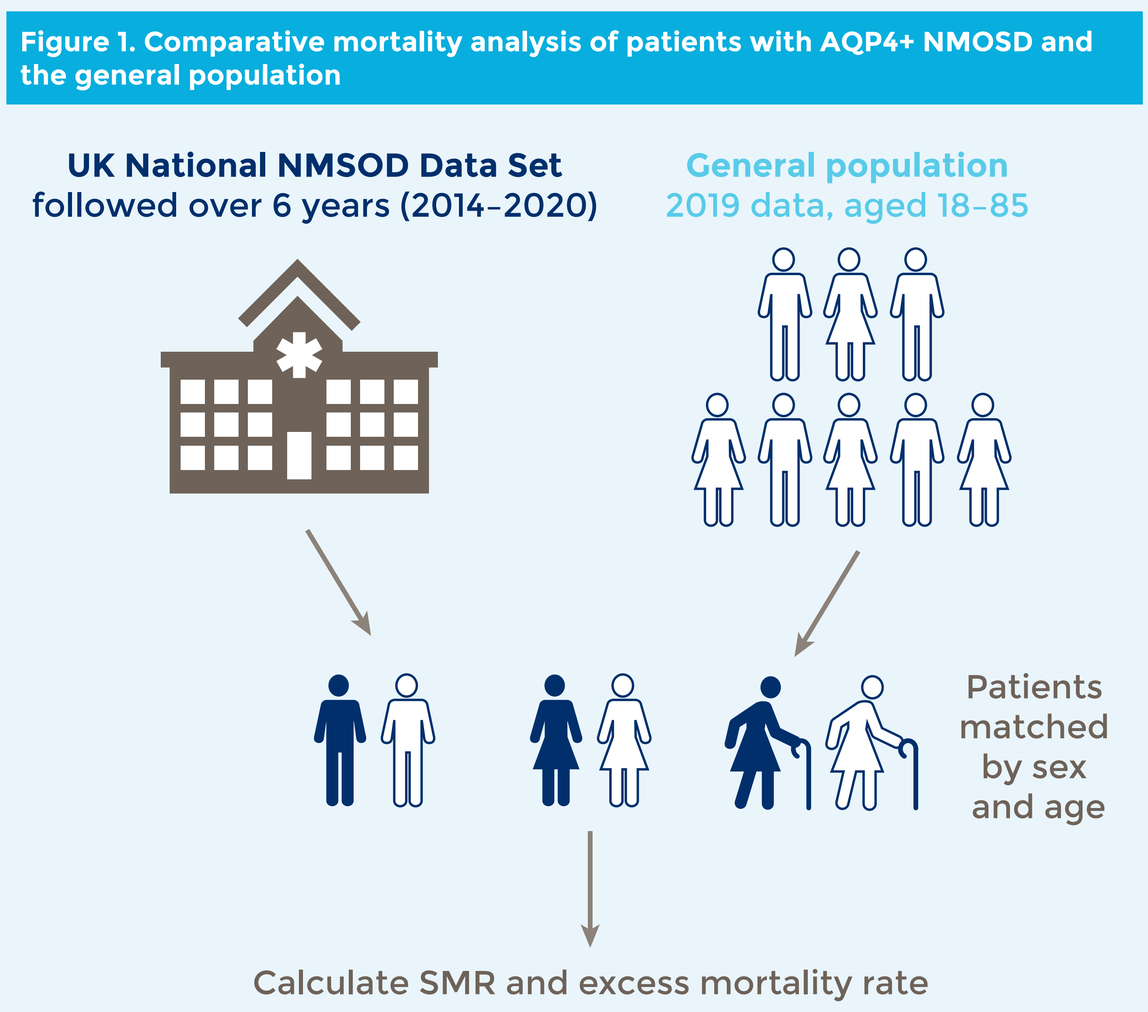
INTRODUCTION AND PURPOSE

- Neuromyelitis optica spectrum disorder (NMOSD) is a rare, complement-mediated autoimmune disease of the central nervous system[1]
- NMOSD is characterised by unpredictable relapses (attacks) that can lead to blindness, paralysis, cognitive impairment, and death[1,2]
- Approximately 75% of patients with NMOSD are seropositive for anti-aquaporin-4 autoantibodies (AQP4+)[2]
- Limited information is available on the mortality rates of patients with AQP4+ NMOSD compared with the general population without NMOSD
- The purpose of this study was to determine the risk of mortality in patients with AQP4+ NMOSD

METHODS

- Patients with AQP4+ NMOSD from a UK National NMOSD Data Set (Oxford, UK), who were followed over 6 years (2014–early 2020), were included; age- and sex-matched patients from the general population (based on 2019 data for those aged 18–85 years) were used for comparison (**Figure 1**)
- Mortality was expressed as the standardised mortality ratio (SMR) calculated by dividing the observed number of deaths in patients with AQP4+ NMOSD by the number of deaths expected in the age- and sex-matched general population
- Excess mortality was calculated by subtracting the expected mortality from the observed mortality in patients with AQP4+ NMOSD
- An SMR of > 1.0 was used to indicate excess death; excess mortality was represented by > 0%

Figure 1. Comparative mortality analysis of patients with AQP4+ NMOSD and the general population



NMOSD, neuromyelitis optica spectrum disorder; SMR, standardised mortality ratio; UK, United Kingdom.

RESULTS

Sociodemographic, mortality, and disease characteristics of the matched cohorts

- A total of 74 patients with AQP4+ NMOSD were included (see **Table 1**)
- The mean and median ages at death were 62.6 and 66.0 years, respectively

Table 1. Characteristics of the AQP4+ NMOSD cohort

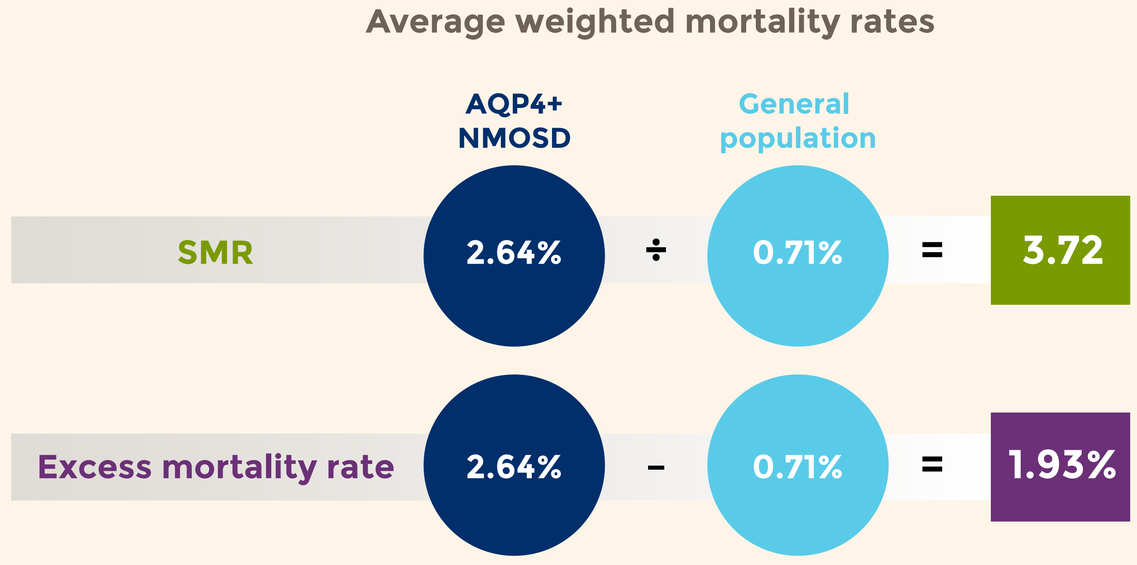
	Patients with AQP4+ NMOSD
Mean age, years (SD; range)	53.73 (16.6; 18–85)
Female, %	87.8
Mean disease duration, years	7.7
Median disease duration, years	8.0

AQP4+, anti-aquaporin 4 antibody-positive; NA, not applicable; NMOSD, neuromyelitis optica spectrum disorder; SD, standard deviation.

SMR and excess mortality

- **The mean annual death rate among patients with AQP4+ NMOSD was 2.64%; in comparison, the average weighted mortality rate of the age- and sex-matched general population was 0.71%**
- **This resulted in an SMR of 3.72 (95% CI: 3.71–3.72) and an excess mortality rate of 1.93% annually among patients with AQP4+ NMOSD versus those in the general population (Figure 2)**

Figure 2. SMR and excess mortality in patients with AQP4+ NMOSD versus the general population



AQP4+, anti-aquaporin 4 antibody-positive; NMOSD, neuromyelitis optica spectrum disorder; SMR, standardised mortality ratio.

LIMITATIONS

- Results of this study are based on patients from the UK and may not be generalisable to the global population of patients with AQP4+ NMOSD
- Treatment with immunosuppressive therapies, such as rituximab, and associated comorbidities were not accounted for in this analysis
- The availability of approved biologics for NMOSD treatment was limited in the UK during the study period; therefore, availability and use of approved biologics would be expected to reduce mortality; it is possible that newly licensed therapies could have reduced the mortality rate of patients with AQP4+ NMOSD

CONCLUSIONS

- **While AQP4+ NMOSD is known to severely affect the morbidity of patients, it also still affects mortality. These data have shown that despite the availability of treatment options with immunosuppressive therapies, such as rituximab, patients with AQP4+ NMOSD still have a higher risk of death**
- **If confirmed after adjusting for comorbidities, these findings would support treating patients with AQP4+ NMOSD with more effective treatments, such as recently approved biologics**

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DISCLOSURES

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